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A Brief Record of the Work of The Connecticut Pomological Society

1891 - 1899



PUBLISHED BY
THE CONNECTICUT POMOLOGICAL SOCIETY
1900

CHAPEL

OFFICERS OF THE CONNECTICUT POMOLOGICAL
SOCIETY (1899)

President.....J. H. HALE, South Glastonbury
Vice-President.....J. H. MERRIMAN, New Britain
SecretaryH. C. C. MILES, Milford
Treasurer.....R. A. MOORE, Kensington



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NEW LONDON COUNTY—L. P. SMITH, Lebanon
MIDDLESEX COUNTY—G. S. BUTLER, Cromwell

EXPLANATORY NOTE

SINCE the formation of our Society in 1891, it has been the desire of its officers to preserve, in printed form, a record of the Society's doings, which have had so strong and helpful an influence on the development of Connecticut's fruit interests.

In its early years the organization was more or less of an experiment, with a paying membership none too large to cover the cost of the annual meetings, printing, etc.; therefore, the Secretary's records were not kept with the idea of publishing an annual report. Even had they been so kept, it would not seem wise to publish them now after so many years have elapsed, during which we have obtained later and more complete information upon many of the subjects discussed in the earlier meetings. Now, however, with our treasury strengthened by a small appropriation granted by the last General Assembly of the state, it has seemed best, in this closing year of the century, to make a brief historical record of our work since the date of organization, and to include some of the valuable addresses and discussions of the annual meetings of 1898 and 1899. Hereafter, it is the Society's intention to issue annually a complete record of the year's transactions.

Neither the Secretary nor President Hale, who has rendered valuable assistance in the preparation of this book, claim any literary merit for the work, having aimed

only at brevity in the compilation of the leading facts in the history and growth of the Society up to this time.

In conclusion, the Secretary trusts that the following pages will prove of some value to the members of our Society and to those who come after us in the great and good work of the higher development of Connecticut's possibilities in fruit culture.

H. C. C. MILES,

Secretary.

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N. S. PLATT, leading factor in organizing The Connecticut Pomological Society

JOHN B. SMITH, First President

T. S. GOLD, P. M. AUGUR and A. J. COE leaders of Connecticut Pomological thought for the past fifty years

Origin of The Connecticut Pomological Society

(1891)



THE impetus given to peach culture in Connecticut by the great crops in the few established orchards in 1889, followed by quite extensive plantings in 1890, prompted the State Board of Agriculture, at its annual meeting of January 21, 1891, on motion of N. S. Platt, of Cheshire, to vote, "That a convention be called at an early day to discuss questions of peach culture," and the secretary was instructed to secure copies of laws in different states in regard to controlling peach yellows.

The convention was called at Room 50, State Capitol, Hartford, Wednesday, February 11, 1891. About forty people were in attendance, and the following programme was successfully carried out:

PROGRAMME

Present Needs of Peach Growers of Connecticut	J. NORRIS BARNES, Yalesville
How to Make Peach Growing a Success	J. H. HALE, South Glastonbury
Commercial Handling of the Peach	J. B. SMITH, New Britain
How to Maintain Health and Longevity of Peach Orchards	P. W. AUGUR, Middlefield
Insects and Diseases Affecting the Peach	N. S. PLATT, Cheshire
Is Legislation Needed to Protect from Peach Yellows	T. S. GOLD, West Cornwall

Such lively and practical discussions followed all these addresses that it was the unanimous opinion of those present that a permanent organization in the interest of fruit culture should be established, and it was voted to organize as The Connecticut Pomological Society. J. B.

Smith, of New Britain; N. S. Platt, of Cheshire; J. H. Hale, of South Glastonbury, and J. Norris Barnes, of Cheshire, were appointed a committee to draft a set of by-laws, and call the meeting for organization.

On call of this committee, December 15, 1891, there met thirty-two Connecticut fruit growers, and these, with J. H. Hale as chairman, organized as The Connecticut Pomological Society, and adopted the following constitution and by-laws:

CONSTITUTION*

ARTICLE I.—The name of this Association shall be THE CONNECTICUT POMOLOGICAL SOCIETY.

ARTICLE II.—Its object shall be the advancement of the science and art of pomology, and the mutual improvement and business advantage of its members.

ARTICLE III.—Any person may become a member of this Society by paying into the treasury the sum of one dollar per annum. If the annual fee remains unpaid for two years, the membership shall cease and the name be taken from the roll.

ARTICLE IV.—Its officers shall consist of a President, First Vice-President, one Vice-President from each county, a Secretary and a Treasurer,—all to be elected annually by ballot, and to hold office for one year, or until their successors are duly elected.

The President, First Vice-President, Secretary and Treasurer shall constitute the Executive Committee of the Society.

ARTICLE V.—The Society shall hold its annual meeting during the month of February, the time and place to be decided by the Executive Committee, at which time the annual election of officers shall be held, various reports be submitted, and an exhibition and discussion of fruits take place, also other business necessary be transacted. Other meetings for special purposes may be arranged for and called by the Executive Committee whenever it is deemed advisable. Printed notices of each meeting shall be sent to every member of the Society.

ARTICLE VI.—The following standing committees, of three members each, on the following subjects, shall be appointed by the President, to hold during his term of office, the appointments to be announced at the annual meeting of the Society:

<i>Business and Legislation,</i>	<i>Fungous Diseases,</i>
<i>Membership,</i>	<i>New Fruits,</i>
<i>Exhibitions,</i>	<i>Markets and Transportation.</i>
<i>Injurious Insects,</i>	

ARTICLE VII.—This constitution may be amended by a vote of two-thirds of the members present at any annual meeting.

*With revisions to date.

BY-LAWS

ARTICLE I.—The President, Secretary, Treasurer and the chairman of each standing committee shall each present a report at the annual meeting of the Society.

ARTICLE II.—The President shall appoint annually two members to audit the accounts of the Secretary and Treasurer.

ARTICLE III.—The Treasurer shall pay out no money except on the written order of the President, countersigned by the Secretary.

ARTICLE IV.—It shall be the duty of the Executive Committee to arrange the programmes for the meetings of the Society, to fill all vacancies which may occur in its officers between the annual meetings, and to have general management of the affairs of the Society.

ARTICLE V.—The Committee on Legislation shall inform themselves in regard to such laws as relate to the horticultural interests of the state, and bring the same to the attention of the Society, and also the need of further legislation. When so directed by the Society, it shall cause to be introduced into the legislature such bills as may be deemed necessary, and shall aid or oppose any bills introduced by others, which directly or indirectly affect the interests of the fruit grower.

ARTICLE VI.—The Committee on Membership, with the coöperation of the County Vice-Presidents, shall bring the work of the Society to the attention of fruit growers throughout the state, and by such means as they deem best strive to increase the membership.

ARTICLE VII.—The Committee on Exhibitions shall suggest from time to time such methods and improvements as may seem to them desirable in conducting exhibitions of the Society, as well as fruit exhibitions throughout the state, and with the assistance of the Executive Committee shall arrange the premium lists, and have charge of the exhibitions given by this Society.

ARTICLE VIII.—It shall be the duty of the Committees on Insects and Diseases to investigate in regard to the ravages of these enemies of fruit culture, and to suggest how to combat them and prevent their spread; to answer all inquiries addressed to them by the members as far as possible, and, when necessary, promptly lay before the Society timely information on these subjects.

ARTICLE IX.—The Committee on New Fruits shall investigate and collect such information in relation to newly introduced varieties of fruits, as is possible, and report the same to the Society, with suggestions as to the value of the varieties for general cultivation.

ARTICLE X.—The Committee on Markets and Transportation shall inform themselves as to the best methods of placing fruit products upon the market, and bring to the attention of the members of the Society this, and any other information concerning profitable marketing.

ARTICLE XI.—The Society will adopt the nomenclature of the American Pomological Society.

ARTICLE XII.—These by-laws may be amended by a majority vote of the members present at any regular meeting.*

LIST OF FIRST OFFICERS OF THE SOCIETY

President JOHN B. SMITH, New Britain
First Vice-President J. NORRIS BARNES, Yalesville
Secretary GEO. S. BUTLER, Cromwell
Treasurer N. S. PLATT, Cheshire

COUNTY VICE-PRESIDENTS

Hartford County J. H. HALE, South Glastonbury
New Haven County C. P. AUGUR, Woodbridge
Fairfield County EDWIN HOYT, New Canaan
Litchfield County T. S. GOLD, West Cornwall
Windham County S. O. BOWEN, Eastford
Tolland County E. S. HENRY, Rockville
Middlesex County J. M. HUBBARD, Middletown
New London County W. H. LEE, —————

*Revised to 1900.

FIRST ANNUAL MEETING (1892)

THE first annual meeting of the young Society was held at Hartford, in room No. 50, at the Capitol, January 26 and 27, 1892, with a large attendance.

President Smith, in his address, referring to the objects and methods of the Society, said, in part:

“Our Society was born of the natural law, ‘No man liveth to himself alone.’ We accept the principle, and hence our Association. We want to know each other better. By meeting together we not only have social enjoyment, but we can increase our intelligence, learn how to improve and increase our methods and better our products.

“It is not possible for one man by himself to reach the greatest excellence. Peaches in Delaware, grapes along the Hudson, plums about Geneva and apples in Niagara county do not prevail so much because the soil is especially adapted to their culture, as because men profit by the example of their neighbors, both in success and failure.

“Through the meetings of our Society we are given opportunities to learn of scientists and practical fruit growers, to talk over our own successes, failures and hopes, to hold field meetings on the farms of our members where we can bring our families together, to better advertise our goods, to secure legislation for the benefit of fruit growers, —in short, to grow and improve ourselves, and thus increase and improve our business.”

The following well-arranged programme was successfully carried out:

PROGRAMME

FIRST DAY

Potash for Fruit Trees, and in What Form to Use It
Prof. S. W. JOHNSON,
Director New Haven Experiment Station
Poultry and Fruit Culture A. C. HAWKINS, Lancaster, Mass.

Combinations of Growers for the Most Successful Marketing of
Fruit A. C. STERNBERG, West Hartford
Can the Fruit Growing Interests of Connecticut be Profitably
Increased, and in What Directions? . . . T. S. GOLD, West Cornwall
(Followed by testimony as to profitable fruit growing from
the fruit cultivators of the state.)

SECOND DAY

The Work of the U. S. Department of Agriculture: Especially
in Its Relation to the Prevention of Plant Diseases and
Injuries to Crops Through Unfavorable Weather Condi-
tions B. T. GALLOWAY,
Chief of the Division of Vegetable Pathology, Washington, D. C
Reports and Election of Officers.

Points About Spraying Prof. W. C. STURGIS,
Connecticut Experiment Station

Preventable Frost Damage Prof. S. T. MAYNARD,
Massachusetts Agricultural College

Peach Yellows, and How We Conquered It T. T. LYON,
Pres. Mich. Hort. Society

The Question Box and discussions of the following problems:

What Shall We Do With Second and Third Quality Fruit?

Live Stock in an Orchard: Sheep, Swine or Poultry?

Frost Damage: How Far Preventable by Fire, Smudge or Otherwise?

Potash for Fruit Trees: In What Form,—Muriate, Sulphate, Ashes, or
Tobacco Stems?

The old board of officers was re-elected, with the excep-
tion of Treasurer. N. S. Platt was relieved, at his own
request, and R. A. Moore, of Kensington, succeeded to the
office.

SECOND ANNUAL MEETING (1893)

Held at the State Capitol, Hartford, January 24, 1893.

PROGRAMME

Eight Years' Experience with Cold Storage. . . . R. A. MOORE, Kensington
Annual Business and Election of Officers.

The Connecticut Peach Crop of 1892: Peculiarities of the Crop
and Markets J. H. HALE, South Glastonbury
New Points in the Cultivation and Fertilizing of Orchards . . .

JOHN R. BARNES, Cheshire

Fruit Packages: Why Not Produced in Connecticut as Cheaply
as Elsewhere? JOHN E. CLOUGH, Tolland
Fruit Canning for the Home or Market . . . C. E. STEELE, New Britain
Spraying Calendar, Giving the Monthly Work to be Looked
after on all Common Fruits

{ Prof. W. A. TAYLOR, Dep't of Agr., Washington, D.C. Prof. W. C. STURGIS, Connecticut Exp. Station Prof. S. T. MAYNARD, Massachusetts Exp. Station
--

The Care, Product and Profits of an Apple Orchard from Four-
teen to Twenty-four Years of Age EDWIN HOYT, New Canaan
Valuable Novelties in Fruits N. S. PLATT, State Pomologist
Facts for Small Fruit Culturists. Prof. W. A. TAYLOR, Washington, D. C.

The President, in his annual address, said that in 1892, Connecticut had the best average fruit crop of any state in the Union; but that immediate attention must be paid to the peach yellows, which threatened the destruction of our orchards, and also to the ravages of the black knot of the plum. "We must not only destroy these diseases in our orchards, but we must be backed up by stringent laws compelling careless growers to cease spreading these great evils."

STANDING COMMITTEES

The President recommended the appointment of the following standing committees, which suggestion was adopted:

Committee on Business and Legislation: J. H. Hale,
A. C. Sternberg, G. S. Butler.

Committee on Membership: H. C. C. Miles, F. P. Dun-
ham, C. I. Allen, S. B. Wakeman, H. J. Hilliard, O. A.
Thrall, G. M. Holt, W. H. Lee.

Committee on Fungous Diseases: Dr. W. C. Sturgis, W. F. Platt, John B. Smith.

Committee on Injurious Insects: Prof. B. F. Koons, E. M. Ives, Dennis Fenn.

Committee on New Fruits: N. S. Platt, Edwin Hoyt, J. H. Hale.

Committee on Exhibits and Charter: J. M. Hubbard, C. P. Augur, J. H. Merriman.

FIRST SPECIAL MEETING (1893)

A successful SPRING MEETING was held at New Haven, March 16, 1893, and the following programme carried out:

PROGRAMME

Strawberries: Best Culture and Varieties JAMES BURR, Monroe
 Raspberries and Blackberries G. S. BUTLER, Cromwell
 The Currant: How to Grow and Market It J. H. HALE
 The Gooseberry: Varieties, Culture and Uses . N. S. PLATT, Cheshire

Recess

Grapes in Connecticut A. J. COE, Meriden
Insect Enemies of Fruit Growers Prof. B. F. KOONS, Storrs
What May be Done by the Experiment Stations for Pomology?

Prof. A. B. Peebles, Storrs



THIRD ANNUAL MEETING (1894)

Held at Hartford, in Room No. 50, at the Capitol,
January 17, 1894.

PROGRAMME

MORNING SESSION

Discussions: Lessons Taught by the Experiences of the Season of '93—	
Orchard Fruits	Opened by J. N. BARNES, Yalesville
Small Fruits	Opened by G. S. BUTLER, Cromwell
High Fertilization	A. C. STERNBERG, JR., West Hartford
Plums	J. W. KERR, Denton, Md.
Question Box.	

AFTERNOON SESSION

President's Address.

Annual Reports of Committees.

Election of Officers and Annual Business. (Old Board Reëlected.)

Apple Orcharding in Connecticut: Can the Estimates given by

Mr. Hoyt, in His Address before this Society in 1893, be
Realized in this State? F. H. STADTMUELLER, Elmwood
(Followed by many Apple Growers)

Peach Yellows J. M. HUBARD, Middletown

Some Good Tools and Methods Not Generally in Use

J. H. HALE, South Glastonbury

There was a good attendance at this meeting, and the interest was maintained throughout. The Secretary reported an increase in the membership list and the thriving condition of the Society was further shown by the report of the Treasurer. It was decided to change the time of the annual meeting from January to February.

In his annual address President Smith spoke of the value to fruit growers of this coming together for interchange of ideas and methods. He advocated annual meetings lasting two days instead of one, believing that all could spend this amount of time with profit, and by so doing, become wiser and better prepared to meet the varied enemies and fight the hard battles which in these days confront the fruit grower.

“During the past season, much to the surprise of some, Connecticut has produced another peach crop. However, the immense southern crop, financial troubles, and our own increased production, all stood in the way of high prices; but some of these factors, as well as the severe drought that affected many orchards, present interesting problems for our study.

“It has been an off-year, for plums and the curculio attacks have been worse than usual. Apples and pears promised well, but severe wind-storms damaged these crops greatly and prevented what would have been very profitable crops. The much-talked-of Kieffer pear was fine, and brought good prices, so far as I could learn. A jar of canned Kieffers is here for your inspection.

“Our committee on Business and Legislation, together

with committees appointed by other bodies, succeeded in securing for us a well-digested 'yellows law,' and one that, in the hands of your excellent commissioner and his efficient and judicious associates, has been, in the main, for the first year, very well executed. It has been an immense power in educating public opinion in the state, and it will, if we persevere, as I doubt not we shall, almost eradicate the disease from orchards, and rid us of one of the chief dangers to profitable peach orcharding. The very large number of peach trees actually found and inspected in the orchards of Connecticut by our commissioners, together with the large number that doubtless escaped their vigilant search, making a total of not far from a half million, point emphatically, as do also many other facts, to the growing importance of the fruit industry of Connecticut,* and so, to the need of The Connecticut Pomological Society."

SPRING MEETING OF 1894

This was held March 13, at City Mission Hall, Meriden, and the following programme carried out:

PROGRAMME

*See A Brief History of Peach Culture in Connecticut, page 175.

FOURTH ANNUAL MEETING (1895)

Held at the State Capitol, Hartford, February 28, 1895.

PROGRAMME

MORNING SESSION

Ripening Pears	R. A. MOORE, Kensington
The Peach Yellows Law: Its Workings and Results . . .	J. M. HUBBARD
Light from Science and Experiences in Michigan with the Yellows.	Prof. A. G. GULLEY, Storrs Agriculture College

AFTERNOON SESSION

Present Conditions of Orchards and Fruit Buds	Discussion
Hints to Connecticut Orchardists.	Prof. A. G. GULLEY
Election of Officers and Annual Business.	
Spraying Calendar	Dr. W. C. STURGIS, Connecticut Experiment Station
Potash for Orchards	Prof. W. E. BRITTON, Connecticut Experiment Station
The San José Scale, Japanese Plums, and Green Manuring . .	J. H. HALE, South Glastonbury

In his address, President J. B. Smith, referred to the gratifying success of the Society, and said: "It was not born out of its time, but as a result of its work has come mutual help and protection to the fruit growers of the state. Again, the past season, Connecticut has shown its adaptability to peach culture, and today the peach industry in this state is a large and growing one. Our excellent peach yellows law is proving a good thing and should be upheld. Of plums we had a phenomenal crop; pears also were fine. The apple crop of '94 was only a moderate one, but we may congratulate ourselves that Connecticut fared better than the country at large. We should look upon the apple as the safest and surest of our fruit crops. Our experiment stations should be equipped to do more practical work in the interests of the fruit grower."

Secretary Butler reported the Society in a flourishing condition, so far as membership was concerned. A balance of \$86.43 was reported by the Treasurer.

The annual election of officers resulted in several changes, as follows :

<i>President</i>	J. H. HALE, South Glastonbury
<i>Vice-President</i>	J. N. BARNES, Yalesville
<i>Secretary</i>	G. S. BUTLER, Cromwell
<i>Treasurer</i>	R. A. MOORE, Kensington

COUNTY VICE-PRESIDENTS

Hartford County	J. B. SMITH, New Britain
New Haven County	N. S. PLATT, Cheshire
Fairfield County	EDWIN HOYT, New Canaan
Litchfield County	T. S. GOLD, West Cornwall
Tolland County	E. H. LATHROP, Vernon Center
Windham County	S. O. BOWEN, Eastford
Middlesex County	J. M. HUBBARD, Middletown
New London County	W. S. LEE, Hanover

MILFORD INSTITUTE

An invitation was received from Indian River Grange, of Milford, for the Society to hold a meeting in that town December 27, 1895, and thus started the first of the Society's many institutes in co-operation with the Granges of the state.

The meeting was held in the Town Hall, Milford, was well attended and was productive of much practical help to the fruit growers present.

The following subjects were considered :

Irrigation in Fruit Culture	
Discussed from the standpoint of practical experience by	
J. C. EDDY, Simsbury ; E. C. WARNER, North Haven, and others	
The Feeding and Culture of Apple Orchards .	J. NORRIS BARNES, Yalesville
Our Insect Enemies, and How to Treat Them	Prof. BRITTON

FIFTH ANNUAL MEETING (1896)

This meeting of the Pomological Society was held at Jewell Hall, Hartford, February 25 and 26, 1896. The programme of the meeting was as follows:

PROGRAMME

FIRST DAY

Annual Address of President	J. H. HALE
Report of Secretary	G. S. BUTLER
Report of Treasurer	R. A. MOORE
Reports of Committees.	
How to Start a Young Orchard	Prof. A. G. GULLEY, Professor of Horticulture, Storrs College
Raspberries and Currants: Culture and Marketing	A. G. SHARP, Richmond, Mass.
The Profits of Water in Horticulture	Prof. H. E. VAN DEMAN, Late Pomologist, U. S. Dept. of Agriculture

SECOND DAY

The New Strawberry Culture	L. J. FARMER, Pulaski, N. Y.
The Grape in North America: History and Culture	Prof. W. E. BRITTON, Horticulturist, Conn. Exp. Station
Nut Culture for Connecticut	Prof. H. E. VAN DEMAN
Election of Officers for Ensuing Year.	
A Year's Experience in Spraying an Apple Orchard	Dr. W. C. STURGIS, Mycologist, Conn. Exp. Station

Numerous questions and discussions, in addition to the above, filled out two days of timely and practical work of great value to the large number of fruit growers attending.

President Hale, in his annual address, reviewed the fruit crop results of the past season of '95. "Fruit growing has become one of the most profitable branches of farming in our state. The apple crop is most important of all, and still there are thousands of acres more in Connecticut that might be made to produce apples to advantage. As showing the value and extent of some of our fruit crops, note the \$500,000 crop of peaches, with a total

of 750,000 trees in the orchards of the State. This number will undoubtedly be largely increased by the plantings of the coming season. There are a million dollars' worth of strawberries grown in Connecticut every year and \$50,000 worth of raspberries."

The Secretary reported a paid membership of 61 and a balance of \$108 in the hands of the Treasurer. The old board of officers was re-elected.

MAD RIVER INSTITUTE

September 17, 1896, an institute was held at Waterbury, on the invitation of Mad River Grange.

The morning session was devoted to examining the excellent exhibition of fruits, both fresh and canned.

The afternoon meeting was addressed by Prof. A. G. Gulley, President J. H. Hale, N. S. Platt, Prof. W. E. Britton, Edwin Hoyt and others, the main topic being, "The Home Fruit Supply."

United States Senator O. H. Platt was present and contributed some brief thoughts on the horticulture of early days in Connecticut.



SIXTH ANNUAL MEETING (1897)

Held February 9 and 10, 1897, at Jewell Hall, Hartford.

PROGRAMME

TUESDAY, FEBRUARY 9

Annual Address of President.

Reports of Secretary and Treasurer.

Reports of Committees.

Fruit at Fairs Prof. A. G. GULLEY,
Prof. of Hort., Storrs College

The Preparation and Use of Bordeaux Mixture . . Prof. W. C. STURGIS,
Mycologist, Conn. Exp. Station, New Haven

Preserving and Increasing the Fertility of Fruit Farms

Prof. H. E. VAN DEMAN,
Late Pomologist, U. S. Dept. of Agr. and Pres. Peninsula Hort. Soc.

WEDNESDAY, FEBRUARY 10

Some Fruit Insects	Prof. W. E. BRITTON, Horticulturist, Conn. Exp. Sta., New Haven
Mutual Relations Between Nurseryman and Fruit Grower . . .	Prof. H. E. VAN DEMAN
Election of Officers for Ensuing Year.	
The Spread of Black Knot	N. S. PLATT, Conn. State Pomologist
Base Hits and Home Runs	H. W. COLLINGWOOD, Managing Editor, "Rural New-Yorker"

THE PRESIDENT'S ADDRESS

President J. H. Hale said, in part:

The year just past has been a particularly trying one for the fruit growing interests of Connecticut. Changeable climatic conditions the winter previous killed the fruit-buds of all except the more hardy fruits ; the canes of raspberries and blackberries were badly injured ; many fields of strawberries were killed out, and all were more or less injured. This, followed by drought in May and June, gave our state the lightest and poorest crop of small fruit it has had for many years.

Prices for good berries were fairly liberal, and commercial growers who had given good winter protection and were able to irrigate through the drought received satisfactory returns.

Peach and plum crops were almost a total failure, which, considering the present magnitude of the business, was a loss of fully half a million dollars. Before this loss, however, five successive crops had demonstrated that the climate of Connecticut was fully as reliable as that of the so-called "peach growing states." Now, with the nearly a million trees in the orchards of the state, the business would continue to be a profitable industry if in every orchard and garden a vigorous fight were continued against that dread disease, the yellows ; and if all interested in growing, selling and eating this delicious fruit would co-operate with the State Peach Commission in driving and keeping out this disease.

Those who would repeal the law were undoubtedly honest in their convictions, but wofully ignorant of the real disease and its effects. But one commercial orchardist was known

to be opposed to the law, most of the other opponents being disgruntled owners of single trees or small groups of them, who would rather have disease and death among their trees than to receive suggestions and help from the state. The owners of over 90 per cent. of the trees in the state were against repeal. Commercial orchardists and well-informed amateurs eradicate the disease at first sight, for their own and their neighbors' protection ; but only the strong arm of the state can guard these orchards and the choice fruit of many a private garden against the spread of disease from over the fence on the grounds of a careless or unthinking man, who, while he would not directly rob nor wrong his neighbor, wants the privilege of maintaining diseased trees that will do it just as effectually. The larger commercial growers, with so much at stake, studied the disease and the ruinous effects of its blighting spread, and were alert at all times to pull out and burn diseased trees promptly.

The law was most helpful to small orchardists and those who want a few peach trees for the family supply; these need the enlightenment and protection of the law.

The one great blessing of 1896 was the apple crop,—the most abundant for many years and more than usually free from imperfections. Prices ruled very low and net cash returns were not so great as in former years; but the great crop caused us to seek wider markets, and a trade has been established that will be of lasting benefit. In 1896, many small towns all through the south had apples in car-lots for the first time, and, in future years, will take many more at higher prices.

With good culture, proper feeding, spraying and thinning, the apple is still the king of fruits for Connecticut. With careful grading and honest packing it will always be a safe and sure money crop and that, too, on much of our rough, hilly land that is of little value for other crops.

Cherry planting has been greatly neglected. In nearly every home where land is sufficient there is a need of from two to six cherry trees, right away, this coming spring ; while, if grown as a commercial crop, our markets are ready for the product of many thousands of trees.

The new race of Japan plums still continues promising.

They are more hardy than peaches ; a number of varieties fruited quite freely, in '96, in orchards where the most hardy peaches failed entirely. The earlier varieties here ripen early in July and a succession may be had till October. A few varieties are very poor in quality, others good, and some superior to any other type of plums known. For canning purposes they are unsurpassed, and I trust that the time is not far distant when we shall have in our state canneries of high grade that shall convert the plums, cherries, peaches and other choicest fruits of Connecticut soil into a product superior to any now on the market. The idea is entirely feasible and only requires backing by men or women of the right stamp to assure its success.

The matter of protection against spring frosts is receiving serious attention. Experience seems to indicate that steam is of far greater value than either heat or smoke. Fires at distances of not over fifty feet apart, lightly covered with wet hay, or other material that may be kept wet all the time and yet not put out the fire, will, in any but a very windy time, cover field or orchard with a fog-like vapor that will hold the frosts at bay.

There are plenty of honest commission men and dealers in the fruit trade. Get them out in the field and orchard. To have all hands in close touch with one another, will do good. A love of the business, judicious advertising, clean packages and honest packing are essential points in commercial fruit culture. New England buyers are the most refined and critical of any, and will always pay liberally for fruit that is beautiful and good.

The family fruit garden may contain more choice varieties, which, through lack of fine appearance or keeping qualities, are not acceptable to the market.

It should be the constant aim of the Society to encourage a love of fruit culture among the young. The refining influence of fruits and flowers must never be lost sight of if we expect to attain the highest civilization. A home that is always freely supplied with earth's choicest fruits and flowers is apt to be the abiding place of pure thoughts and actions."

The annual report of the secretary, G. S. Butler, showed an increase of about 75 per cent. in the membership during

the year,—a total of 107 members on the roll. The Secretary suggested that the Society was losing the full benefits of its work through the failure to publish its proceedings: "Under present conditions it is, of course, impossible to do otherwise. A larger paying membership, or aid from the state will be necessary before this important feature can be carried out."

The Treasurer presented a very satisfactory report in further evidence of the growth of the Society.

The Society adopted resolutions in regard to the peach yellows law, as follows:

WHEREAS, The Peach Yellows Commission of the State, by its practical work and educational influence during the past four years, has done much to hold in check and in a large measure stamp out, the dread disease known as "peach yellows," and has greatly stimulated the planting and cultivation of the peach within our state, both as a commercial crop and for family supply; and

WHEREAS, The continuation of the good work will undoubtedly enable Connecticut to become a leading peach-producing state so that every home-garden may yield an abundance of this delicious fruit and commercial orchards add to the wealth of the state many thousands of dollars annually; and

WHEREAS, A bill for the repeal of this most helpful law is now before the General Assembly; therefore

Resolved, That the Connecticut Pomological Society, in its mission as an aid to and promoter of higher ideals in fruit culture and of the development of the state's resources, is opposed to such repeal and would urge all the members of this Society to interview their senators and representatives and explain to them the nature of this infectious disease and the injury likely to result from the repeal of the successful yellows law.

Resolved further, That a committee be appointed to appear before the Agricultural Committee of the Legislature and oppose the repeal of the peach yellows law.

In the annual election of officers several changes in the board were made.

The following were chosen for the ensuing term:

<i>President</i>	J. H. HALE, South Glastonbury
<i>Vice-President</i>	J. H. MERRIMAN, Southington
<i>Secretary</i>	H. C. C. MILES, Milford
<i>Treasurer</i>	R. A. MOORE, Kensington

COUNTY VICE-PRESIDENTS

Hartford County	W. H. MANSFIELD, West Hartford
New Haven County	DENNIS FENN, Milford
Fairfield County	S. B. WAKEMAN, Saugatuck
Litchfield County	C. I. ALLEN, Pequabuck
Tolland County	GEO. WEBSTER, Rockville
Windham County	LUCIEN BASS, Windham
New London County	L. P. SMITH, Lebanon
Middlesex County	G. S. BUTLER, Cromwell

CHAIRMEN OF STANDING COMMITTEES

<i>Business and Legislation</i>	E. M. IVES, Meriden
<i>Membership</i>	H. G. MANCHESTER, W. Winsted
<i>Injurious Insects</i>	Prof. B. F. KOONS, Storrs
<i>Fungous Diseases</i>	Dr. W. C. STURGIS, New Haven
<i>Fairs and Exhibits</i>	Prof. A. G. GULLEY, Storrs
<i>New Fruits</i>	N. S. PLATT, Cheshire

VERNON CENTER INSTITUTE

The institute season of '97 opened with a meeting in conjunction with the Vernon Grange, at Vernon Center, March 19, 1897. A goodly number of those interested in fruit culture responded to the invitation, and an interesting practical meeting was the result. Some of the subjects under discussion were:

<i>Green Manuring</i>	President J. H. HALE
<i>Hints on Pruning and Thinning</i>	Prof. W. E. BRITTON, Conn. Exp. Station, New Haven
<i>The Spraying of Fruit Crops</i>	Prof. A. G. GULLEY, Storrs College
<i>Orchard Culture</i>	J. H. MERRIMAN, Southington
<i>Japanese Plums</i>	N. S. PLATT, Cheshire
<i>European Plums</i>	G. G. TILLINGHAST, Vernon

SOUTHINGTON INSTITUTE

January 21, 1898, a very successful institute was held at Southington by invitation of Union Grange.

At the morning session, after music and an address of welcome, Dr. W. C. Sturgis, of the Connecticut Experiment Station, spoke on "Some New Features in Spraying."

George F. Platt, of Milford, contributed a paper on

"Observations in Southern Orchards," which provoked an interesting discussion on orcharding in general.

The ladies of the Grange served a bountiful lunch during the noon hour. On reassembling, the meeting listened with interest to an address by President J. H. Hale on "Small Fruit Culture for Kitchen and Market."

Dr. Sturgis spoke on the "San José Scale," giving a history of this dangerous pest. It is known to be present in this state, in New London county, and near Hartford, New Haven and Bridgeport. Its first introduction is along traveled lines. Kerosene emulsion and also whale-oil soap (two lbs. to one gallon of water), were recommended as remedies for the scale.

In the discussion which followed it was maintained by several that the scale would prove a blessing to fruit growers, however otherwise it might seem. It would put an end to careless methods in fruit growing.

"Horticultural Novelties" were discussed by G. S. Butler, of Cromwell, and N. S. Platt, of Cheshire.

The discussion of the contents of the Question Box furnished much practical information.

After a vote of thanks to the Grange for its hospitality, the meeting was brought to a close.



SEVENTH ANNUAL MEETING (1898)

The seventh annual meeting of the Connecticut Pomological Society took place in Jewell Hall, Hartford, February 1 and 2, 1898. Owing to a severe snow storm the meeting did not open at the appointed time, Tuesday morning, February 1. It was not until two o'clock Tuesday afternoon that the meeting was called to order by President J. H. Hale. But a small number of members were then present, although later sessions were marked by the usual large attendance.

Some of the speakers were prevented from reaching the meeting on time, which necessitated changes in the pro-

gramme, and caused the meeting to extend over three days instead of two. The original programme ran as follows:

PROGRAMME

TUESDAY, FEBRUARY 1

Opening Session

Annual Address of the President.

Reports of Secretary and Treasurer.

Reports of Standing Committees.

Horticultural Theories Prof. A. G. GULLEY,

Prof. of Hort., Storrs College

New Varieties of Small Fruits G. S. BUTLER, Cromwell

Afternoon Session

A Big Job for the Little Man H. W. COLLINGWOOD,
Managing Editor "Rural New Yorker"

Horticultural Reminiscences T. S. GOLD, West Cornwall

Japan Plums and Other New Fruits H. L. FAIRCHILD, Nichols

WEDNESDAY, FEBRUARY 2

Morning Session

Recent Experiment Station Work of Interest to the Fruit-
Grower Prof. W. E. BRITTON,
Horticulturist, Conn. Exp. Station

Fruit Illustration J. HORACE McFARLAND, Harrisburg, Pa.

Afternoon Session

Election of Officers for Ensuing Year.

Work and Results at Fruitvale Farm MORTIMER WHITEHEAD,
Middlebush, N. J.

The Relation of Foliage to Fruit N. S. PLATT,
Conn. State Pomologist

Apple Possibilities in Connecticut
Discussion, opened by EDWIN HOYT, New Canaan;
G. F. PLATT, Milford, and LUCIEN BASS, Windham

THE PRESIDENT'S ADDRESS

In his annual address, President Hale touched briefly upon the growth and prosperity of the Society and the growing interest in pomology in all parts of the state,

especially in the largely attended field meetings which had been held, and urged that more of the members open their home grounds by invitation to the Society. The moral effect of such a visit to any farm he thought worth many times the bother of entertaining the visitors.

The fruit season of '97 had been an exceedingly interesting one. An abundance of rain had made tremendous crops of small fruits. The berries, etc., were large but rather soft, watery, and not of the usual high flavor; consequently prices had been lower than ever known before in this state. Japanese plums had, for the first time, fruited quite generally throughout the state, and were proving larger, of greater beauty and better quality than most people had supposed. They were destined, in the near future, to be one of the leading market fruits of the state.

The peach crop had been of uncertain quantity and value; where the crop had succeeded, the fruit was large and of great beauty, but the poorest in quality that the state had ever seen. Many of the standard freestone varieties had clung more or less to the pit, and there had been a general complaint in the market of clingstones, so that the market price had fallen off 50 per cent from that of former years. A lack of preparation on the part of some to take care of the surplus had, for a short season, over-loaded some of the local markets, and this had had considerable to do with the lower prices.

Mr. Hale also called attention to experiments that had been made by spraying peach trees with whitewash to protect buds against the climatic changes of winter and retard blooming in spring, and urged the members of the Society to take this into consideration.

"The effect of the repeal of the yellows law was particularly noticed in early August, when many diseased peaches came into the state from New Jersey and Delaware, and demoralized the market for better home-grown fruit. All of this fruit might have been kept out of the state, to the benefit of all concerned, had the law not been repealed.

"A very serious menace to peaches, cherries and plums is the brown rot, which has been unusually prevalent the past wet season. Spraying with Bordeaux mixture when the

foliage is on, is a dangerous experiment. The only means of combating the disease known at present is to thoroughly saturate the trees with Bordeaux when in a dormant condition, destroying all specimens of mummified fruit that may be left over from the year before, and daily picking off the rotting specimens during the ripening season.

"The San José scale, about which there is so much talk, may prove a blessing in disguise by compelling all tree-owners to look more carefully after their trees, and, in so doing, discover many other things that might otherwise be neglected. The scale is probably pretty well distributed all over the state, but with careful attention it is not likely to work very serious injury, except among the more careless cultivators."

REPORT OF THE SECRETARY

Mr. President and Fellow Members:

At the last annual meeting the Society had a total membership of 107. During the year most of this number have been retained, and we have gained about fifty new members, making our present total membership 151. We have had on our roll since the organization of the Society 210 names, but not all of these members have continued their interest in the work to the extent of renewing their membership from year to year, as our bylaws require; therefore 60 of the 210 names have been dropped. These delinquents have been frequently importuned from the Secretary's office to reinstate themselves, but only in a few instances has the suggestion been heeded. This emphasizes the need of more energetic work on the part of the Committee on Membership and the various County Vice-Presidents. There is no reason why this Society should not reach 200, or even 300, members, if officers and members in each county would present the good features of the organization to the fruit growers of their respective sections.

The system of membership badges was inaugurated at the suggestion of the President, and has worked quite satisfactorily. It has served to distinguish the actual members from those who are merely spectators at our gatherings.

Since entering upon the duties of this office a year ago, I have received and paid over to the Treasurer \$81, and have drawn orders for the payment of bills to the amount of \$44.20. The work of the Secretary's office has been carried on at an expense of \$12.55.

In 1897, four meetings were held, including the annual winter meeting of two days in February. The latter was a decided success, and far eclipsed any previous efforts of the Society. The attendance on both days was large, and the interest shown in the excellent programme and many practical questions was gratifying.

March 19th, by invitation of Vernon Grange, an institute meeting was held at Vernon Center. This meeting was marked by a good attendance and a lively interest in all the addresses and discussions, which were of a very practical nature. Much credit is due to the members of Vernon Grange, and especially to our good brother, E. H. Lathrop, now deceased, for efforts to make this institute a most successful one.

The next gathering of the members was at the famous fruit farm of our honored President, at South Glastonbury, June 15. Doubtless that red letter day is still fresh in the minds of all who were so fortunate as to be present. We can easily recall that remarkable trial-plot of forty-three varieties of strawberries, the large berry fields, the mammoth peach orchards, the thousands of young peach and plum trees, the experiments in chestnut grafting, the system of irrigation and intensive cultivation, the pleasant and well kept home-grounds of our genial host, the bountiful lunch under the trees, and the informal gathering when we listened to words of wisdom from many of the distinguished horticulturists present. Nearly 400 attended this field meeting, and at least eleven states were represented. It is safe to say that the experiences of that day will not soon be forgotten among our members.

The fourth meeting of the year was held at the fruit farm of the Messrs. Butler & Jewell, in Cromwell, August 11. Nearly 150 were present at the meeting, and were well repaid for attending. We were treated to the novel sight of a big orchard of Japan plums, the trees of which were loaded al-

most to breaking with beautiful fruit, much of it just ripening. Probably no more remarkable showing was ever made in New England, and it called forth words of praise and delight from all present.

To be of the greatest usefulness to its members and to the fruit-growing interests of the state, this Society must be progressive, and take advantage of every opportunity to improve its work; therefore, I take the liberty of offering a few suggestions which, if carried out, would, I believe, result in extending the benefits of the organization very largely.

Our greatest need is more funds to work with. These can be secured, either by a larger membership, or by an appropriation from the State Treasury. The first is within our reach, as has already been indicated. As for a state appropriation, we are all agreed that the importance of our work deserves it, the only difficulty being a favorable opportunity for securing it. We should certainly take some steps in the matter now, and be prepared to press our demands before the next legislature. With more funds at our command, we could publish the proceedings of our meetings, thus preserving for the use of the members, valuable information contained in the addresses and discussions of the year. This would be an added inducement for members to renew their membership from year to year. Much useful information with regard to injurious insects and diseases, the conditions of fruit crops and of the markets, might be gathered and circulated were the necessary funds available. This is a prominent feature of the work in adjoining states.

Our plan of field meetings should certainly be continued and, if possible, further extended. The culture of fruit for market is so rapidly increasing in our state that there are now many large farms that well repay a visit; or, where several smaller ones are located near together, a tour of them all may be made in a day, as is done in Massachusetts. Fruit exhibitions might be made a more prominent feature of all our meetings if each member would make an effort to contribute specimens. The good showing at this meeting is very gratifying.

In order to increase the actual benefits of membership, would it not be well for this Society to set in operation a plan of co-operation, either in buying or selling? We know that among farmers generally there is a demand for a plan whereby they may act together in these matters. Could not a purchasing agent or a committee buy for the members of this Society such supplies as baskets, fertilizers, etc., and effect a saving to all concerned? Cannot something be accomplished toward assisting members to market their fruit more satisfactorily?

These are some of the lines along which the work of the Society might be extended and made more beneficial to the fruit growers of the state, and I trust they may receive your consideration.

In conclusion, let me thank all who have, by their kind support and co-operation, assisted the work of this office.

Respectfully submitted, H. C. C. MILES, *Secretary.*

REPORTS OF COMMITTEES

The Committee on Business and Legislation reported through their chairman, E. M. Ives, of Meriden. The Committee favored making an effort to secure an appropriation from the state for extending the work of the Society. It also suggested that we work for a larger membership. Every person already a member of the Society can, by a little effort in the right direction, do much to bring about the desired result.

The Committee were of the opinion that a peach yellows law should again be placed upon the statute books of the state. The expense of operating such a law might be placed on the towns or counties. Local option stamping out this dangerous disease they thought not desirable.

Following the report of above Committee, on motion of Professor Britton, the following resolution was adopted:

Resolved, That the Committee on Business and Legislation be instructed to prepare and introduce into the next session of the Legislature, a bill giving to this Society the annual sum of \$500 for the purpose of publishing the transactions of the annual, field and institute meetings of the

Society, and any other matter of benefit to the pomological interests of the state.

The Committee on Fairs and Exhibits reported through its chairman, Prof. A. G. Gulley, of Storrs College. The Committee had visited many of the fairs held in the state last season, and was glad to note the improvement in the correct naming of fruits. Very many of the fairs contained fine collections of fruit. Fairs should all adopt a uniform style and color for premium cards.

Among other excellent suggestions offered by this Committee, that of offering premiums for fruits exhibited at the various meetings of the Society was favorably received; also the suggestion that the Society offer premiums for the best orchards.

The following resolutions were unanimously adopted by the Society:

WHEREAS, It is the custom of this Society to hold summer meetings, and

WHEREAS, The interests of these meetings would be greatly increased by exhibits of products in season,

Resolved, That it is the sense of this Society that premiums to the amount of at least \$110 should be offered for display of horticultural products at these meetings, open only to members of this Society.

Resolved, That the Committee on Fairs and Exhibitions be instructed to prepare a list of premiums to be offered, as shall best comply with the above resolutions.

N. S. Platt, State Pomologist, reported for the Committee on New Fruits.

The good qualities of the Lewis peach were called to notice. This is a Michigan variety, earlier than Mount Rose, and of fair quality. The Champion peach held its place as a very worthy sort. Walker's Free is similar to Stump, and is a valuable variety in its season. Wheatland did well last season. The Early Prolific, which is another name for Kalamazoo, is desirable. Varieties of peaches that are off color are not desirable for market; Thurber belongs to this class. Among plums, Giant Prune, one of Burbank's productions, was recommended as very large and of good quality, ripening later than Lombard. Oregon gooseberry was found a worthy sort.

In closing the Committee called attention to the remarkably fine exhibit of apples sent to the meeting from the New York Experiment Station. Among the varieties of special merit were cited Rome Beauty, Sutton Beauty, York Imperial, Gano, Stark and Blenheim. The following resolution was introduced by Professor Gulley, and passed unanimously:

Resolved, That the thanks of this Society be, and are hereby, tendered to the State Experiment Station of New York for the beautiful and valuable collection of apples donated for exhibition at this meeting.

Resolved, That the Secretary be instructed to send a copy of these resolutions to the Director of the New York Experiment Station.

Professor Britton addressed the Society on the matter of publishing the proceedings of our meetings, and endorsed the suggestions made by the Secretary in his report. He thought that members should be wide awake in their business, and report promptly to the Society any matters of importance to the fruit growing industry. These reports and the reports of all our meetings should be published annually, and thus made available to the people of the state.

On motion, it was voted that as an aid in extending the influence of this Society, the Pomona of the State Grange and the associate Pomonas of the subordinate granges be enrolled as honorary members of this Society.

The committee appointed early in the session to report a list of names for officers for the ensuing year, reported the following:

OFFICERS FOR 1898

<i>President</i>	J. H. HALE, South Glastonbury
<i>Vice-President</i>	J. H. MERRIMAN, Southington
<i>Secretary</i>	H. C. C. MILES, Milford
<i>Treasurer</i>	R. A. MOORE, Kensington

COUNTY VICE-PRESIDENTS

Hartford County	W. H. MANSFIELD, West Hartford
New Haven County	DENNIS FENN, Milford
Fairfield County	S. B. WAKEMAN, Saugatuck
Litchfield County	C. I. ALLEN, Pequabuck
Tolland County	GEO. WEBSTER, Rockville
Windham County	LUCIEN BASS, Windham
New London County	L. P. SMITH, Lebanon
Middlesex County	G. S. BUTLER, Cromwell

On motion of Mr. Butler it was voted to accept the report and adopt the recommendations of the Committee, and the Secretary was instructed to cast a ballot for the above named officers for 1898-99.

It was also voted to appoint a committee of three to revise the by-laws of the Society and report at the next annual meeting. The President appointed Prof. W. E. Britton, Dennis Fenn and Secretary Miles.

The following resolution regarding the foreign market for fruits was introduced by E. M. Ives and unanimously adopted :

WHEREAS, It has come to the knowledge of this Society that the German government has by recent action excluded the fruits of our orchards from the markets of that country, thereby violating existing treaties ; therefore be it

Resolved, That we urge upon our senators and representatives in Congress that they take such prompt and energetic measures as will tend to remove this action, so detrimental to one of the staple export products of this and many other states of our Union.

The chairmen of standing committees for the ensuing year were announced by the chair as follows :

Business and Legislation, J. C. Eddy, Simsbury ; Membership, E. M. Ives, Meriden ; Injurious Insects, Prof. W. E. Britton, New Haven ; Fungous Diseases, Dr. W. C. Sturgis, New Haven ; Fairs and Exhibits, Prof. A. G. Gulley, Storrs College ; New Fruits, N. S. Platt, New Haven.

In the course of this meeting the Society gleaned much practical information from the following addresses and papers.

NEW VARIETIES OF SMALL FRUITS

By G. S. BUTLER

IT is practically impossible for the average fruit-grower to obtain reliable information in regard to novelties.

Those who are honest (like ego) are ignorant; those who know can't afford to tell until after the public has paid the regular fee for finding out; viz., all buy one.

If nurserymen would make it a rule to test, on their own grounds, every article they list before offering it, they would save many a disappointment to their customers; but who would reward them for the time and dollars spent in such service? The constant demand for some new thing, which the Athenians manifested generations ago, must be satisfied, and gardeners cannot wait for their local nurseryman's trial; he must know about these new things when they are first mentioned and be able to supply them at once, or his customers are lost, perhaps forever.

The new and rare importation from Japan, New Zealand or Patagonia has never been heard of except by some "wizard," or buzzard, "of horticulture" in Siberia or Borneo; and, of course, the nurseryman knows only what he hears,—that the novelty is undoubtedly destined to revolutionize horticulture. When people can detect in one little plum the flavor of peach, apricot, nectarine, grape, water-melon, tomato and horse-chestnut, what further use have we for all those old useless relics of bygone ages?

I would not for a moment belittle the work of honest men who are trying to give us something better than we now possess. Their successful work will brighten the lives of all future generations and encourage others to pry still deeper into nature's secrets. I believe we are only at the gateway to scientific horticulture. The continued labors of such men as Luther Burbank, who, it is said, makes it a rule to destroy every plant not equal in every way to some similar one already in cultivation, and its superior in one or more points, following up the survival of the fittest for generations with his plants, can but be the greatest blessing to horticulturists and humanity; nor can this generation appre-

ciate or understand its extent. If all nurserymen would adopt the Burbank rule it might be safe for the average gardener or fruit grower to surround himself with every novelty; but, while we are as we are, beware of anything that we ask four prices for. Buy lightly of it if at all, and test it for yourself; or, better yet, let your neighbor spend his filthy lucre and you pocket his experience. Let our experiment stations buy and care for specimens at the first opportunity (not wait until some nurseryman gives them a plant), report on them as soon as possible, *and then be sure of your men!* Don't let the director wait too long before telling the whole story, the whole truth of each year's behavior.

Perhaps, after this rambling talk, I ought to mention definitely a few novelties of recent introduction that are of very doubtful value: Primus, Tree Strawberry, Mayberry, Tree Blackberry, Wineberry, Rocky Mountain Cherry, Logan Berry.

SAVE THOU A FARM, IF THOU WOULD'ST SAVE THINE OWN

By HERBERT W. COLLINGWOOD, Editor of "The Rural New-Yorker"

YOU Connecticut Yankees can get up a bigger meeting than we can in New Jersey, but in one point we beat you—we have a larger proportion of ladies. At one institute I recently attended we had thirty people in the hall, and six of them were "women folks;" that means 20 per cent of the total attendance. Over here you have hard work to draw out half of 1 per cent. Ever since Adam's wife got her husband into trouble over the apple business, I observe that fruit growers are very cautious about taking their wives along with them to any place where it would be possible for them to pick up a little extra fruit knowledge. Therefore they leave them at home to keep the house warm and do the chores.

As I understand it, the central thought of your meeting is the fact that the Connecticut farmer cannot longer compete with the western farmer in producing the ordinary

crops of the farm. I heard a man say last week in Rochester that the apple crop of western New York in '96 was as great a disappointment to the growers as was the apple crop in the garden of Eden. That was because railroads and the transportation companies between the orchard and New York took so much of the selling price of the apples that there was practically nothing left. It seems to me that you are wise in thinking and saying that the apple crop, wisely handled, is one of the best things left for the Connecticut farmer. You are close to your markets, and, whether apples are high or low, you can cut off the cost of getting apples to the consumer, which will always keep the western man at a disadvantage. You will have to compete with the western apple growers, and they have set the pace in the New York market with the Ben Davis apple. You New Englanders are partly responsible for that. You have gone up and down this country and into printed pages of newspapers and books, extolling the merits of the red apple. You have educated the people of this country into the apple-eating habit, and nothing can take it out. Having done this, you have failed to fill the markets with the very apples you talk about, and the result is that the western grower is making use of the advertisement you have paid for in selling Ben Davis.

There would be no sense in raising Ben Davis apples here in New England to compete with those grown at the west. You have got to show that these Connecticut farms are capable of producing something that is worth while, something that will sell for good hard money. You can do that with your red, crisp, juicy apples, far superior in quality to those grown out west. Make a reputation for high-grade stock, and you will sell all the apples you can grow.

In one of Whittier's poems occurs the line: "Save thou a soul, if thou would'st save thine own." Changing this a little, I would say to the New England farmer: "Save thou a *farm*, if thou would'st save thine own." This may seem like a radical statement, but I believe that the more you help farms about you to produce good fruit, the more you add to the value and reputation of your own farm.

The great strength of the western fruit grower is that he is able to produce large quantities of fruit, which insures uniformity of appearance in packing. A single individual New England farmer cannot hope to succeed as well as he could if all around him the farmers were turning out a first-class brand of fruit. I once heard of a tree peddler who traveled through Michigan selling apple trees. There was one old farmer living in disappointment and sorrow, and the tree peddler tried to sell him some trees. The old man refused to buy. He said he had no use for apple trees; all he wanted was to sell his farm. And so, year after year, the tree peddler came with his apple trees and tried to sell them, and the old man, each year a little grayer, a little more crusty and a little more unhappy, said: "I do not want your trees; I only want to sell my farm." This went on for ten years, and for the last time the tree peddler came on his old errand; again the man refused to buy, with his old excuse. Then the tree peddler stopped long enough to say:

"For ten years I have been coming into this neighborhood trying to sell apple trees; ten times you have refused to buy, because you wanted to sell your farm. Suppose that the first year I came here you had bought a fair outfit of trees, that you had put them out and spent the time that you have spent in growing in taking care of them. Do you know what would be the result today? Men from all over the country would be running after you trying to buy your farm."

"Why?"

"Because you would have given it value and character and put it into condition to produce something. Instead of this, you have been sitting here, year after year, refusing to give your farm a chance; and you could not sell it today, if you had a customer, for as much as it would have brought ten years ago. If you had taken hold of the apple trees before your hair was so gray, men would now be chasing you through all your waking hours for a chance to buy your farm."

And so, I say, give strength and character and reputation to these broken-down farms of New England. Show

the world what they can do in the production of apples, and you will give increased character and value to every farm in Connecticut that is worth saving from the forest. There are thousands of acres here in this state and in Massachusetts that would better go back to the forest again. Give them up, as a hopeless struggle; but do not let any good apple land go back into the clutches of the oaks and the pines.

I have always believed that if the pilgrim fathers had known what was west of the Hudson river they would have made a bee-line away from the coast, through the forest, and never stopped until they struck better land. But I call it a mighty good thing for this country that they did not know what was back from the ocean. It is the character ground out of rocks on the hills of New England that has given strength and reputation to the nation, and you cannot possibly weaken this country quicker than by driving the young men and the young women, and the boys and girls away from New England with the idea that they cannot make a living back on the old farm. At the battle of Bunker Hill the New England farmer fought beneath the banner which bore a pine tree as a patriotic emblem; to-day the New England farmer might well fight a commercial battle under a flag bearing the picture of a Baldwin apple tree.

I was greatly interested in listening to Mr. Morrill's talk in regard to the cultivation of his peach orchard, for I believe thoroughly in this constant cultivation of the soil. You cannot possibly cultivate it too much. In some parts of the country I observe that farmers who once believed in pasturing stock in the orchard are now giving that up, for they have become crazy on the subject of constant cultivation. This means that the clover crop is going out, for the clover plant and cultivator cannot occupy the same spot. This loss of the clover means more money to be spent for purchased nitrogen, but the constant cultivation gives a better tree. Some of the Delaware farmers have a way of handling the southern cow pea that I think would suit you orchard men. Down there they sow the southern cow pea in drills three feet apart at the proper time, and

cultivate like any other cultivated crop. They keep the cultivators running until it is impossible to get through the vines, and then they either let them alone or sow crimson clover seed, just as they would if they were cultivating corn. The result is that they are able to give the orchard constant cultivation and, at the same time, add at least one, and possible two, humus crops.

I am always sorry to hear anyone say a word against clover, and, therefore, it is a good plan to give a substitute when the clover is drafted out by the cultivator.

I remember once, when I was working my way through college, four boys met in my room one night. In the course of conversation, one said to the other, "Who is paying your way?" That interested me, for I was sliding through college on my wits, and I found it pretty hard sliding.

John said: "Father gave me ten acres of land; mother lent me seed wheat; and I took father's team and tools and put in the whole ten acres. It is true, father picked out the poorest ten acres on the farm, but in spite of that, after I get the crop harvested and threshed, there is enough left to keep me a-going pretty well."

Dick said: "Father put aside a Poland China sow for me, and the pigs and the pork from that sow are carrying me through college. I do not feel a bit ashamed to ride through college on a pig's back; I find it a comfortable seat, and that sow is to be respected."

Then Tom spoke up: "You boys talk about your wheat and your sows; they are all right, but I have what I call a good thing. I read in an agricultural paper, five years ago, something about clover. Father would not spend a cent for it, but I told him I would buy the seed and put it in; and he was to give me the increase in the rotation of all crops that could be fairly counted to the clover. Well, I bought the seed with the little money I had on hand; I put it in, and I tell you, boys, I am in clover, and it is a mighty happy state to be in."

Now, my friends, it always hurt my feelings to see that boy wearing a new hat or budding out in a new suit which clover had bought for him, while I was trimming off my

clothes with a pair of scissors, and rubbing them over with soap and ammonia, because I had nothing but my wits. I have been a clover crank from that day until now, when I begin to think that the cow pea is really a little bigger man than old clover himself.

The cow pea has done a good job for me, and I will always stand by it. I would rather be known as "Cow Pea Collingwood" than be elected as a member of the legislature. The cow pea has practically doubled the productive value of my little place in New Jersey, and it makes a better use of potash and phosphoric acid than anything I have been able to find.

I notice here in your fruit exhibition what I call a curious thing. Here are two Baldwin apples; one is bright and rosy, and the other pale and colorless. I have been studying them for a long time and trying to find out why this bright red fellow should make such a fine showing by the side of his pale-faced brother. I do not know whether a blind man would find any difference in the two apples, but Mr. Hale says there would be a great difference. If you were to put these two apples on the market in New York City, where fine bright apples are wanted, this red fellow would outsell the other by 50 per cent. And here comes in another curious thing. There are lots of people in New York who have been fooled by Ben Davis. They see a red-striped or a red-cheeked apple and they will say, right off: "Ben Davis, Ben Davis; we do not want it." They recognize the earmarks on the apple, and do not go down beneath its hide to know whether those earmarks are only skin deep. I remember once, years ago, that old Uncle Daniel had what he called "a famous test of character." He used to say sometimes, through the long winter evenings when we were sitting around the fire, "Boys, do not trust a man until you see the Lord's earmarks on his knee." What he meant was something like this: When a man in sorrow, in trouble, or in gratitude, went down on his knees to thank the Lord for what He had done, or to ask help, and got up without brushing the dirt off his knees, that was a man to have confidence in, because he was not ashamed of the earmarks on his knee.

Now old Uncle Daniel meant well, and he believed this thoroughly, but it was a great shock to him when one day he found a man with his knees all dusty, who had been down hunting for half a dollar that somebody else had dropped without knowing it. I sometimes wish I had the old gentleman's faith, but, unfortunately, I have lived long and hard enough to know that some men wear on their knees the devil's earmarks, rather than the Lord's.

There are lots of consumers in the great cities who are looking for the Lord's earmarks on the apple. You have taught them on all occasions to look for the rich, red, striped apples, and, in looking for them, they run across Ben Davis, finding anything but the Lord's earmarks when they put their teeth into it. You men are partly responsible for this. You have gone about bragging of your Baldwins, and then refusing to grow the apples you bragged about; so that our western friends have tried to live on the reputation you have made. And so, I say, it is not going to be all plain sailing for the red apple. It will take a number of years to get the Ben Davis earmarks out of the fruit. The Sutton Beauty and the Baldwin have got to hustle as never before to get back what rightly belongs to New England. They will do it, in time, if you men continue to tell the truth about your apples, and have faith enough in your own words to make these New England hillsides bloom with this noble fruit.

SECRETARY GOLD'S HORTICULTURAL REMINISCENCES

HORTICULTURAL REMINISCENCES was the subject of a very interesting talk by Secretary T. S. Gold, of the State Board of Agriculture. His earliest memory was of eating apples, when but two and a half years old, from the hand of his grandmother, who died some months before he was three years old; so there could be no mistake as to his early start in a love for the products of horticulture.

The grafted varieties of apples common at that time were

“Pearmain” and “Seek-No-Further;” they are still with us. Later on, the Rhode Island Greening and Spitzenberg took the lead. The Baldwin came considerably later. Sweet Bough was one of the first grafted varieties of apples Mr. Gold remembered.

Apples were plenty in those days, up to 1835, which was an “off year,” there being no apples throughout the state on account of a hard freeze in May. Native kinds were the main dependence. In every orchard of a hundred trees there were all colors and flavors, some early and some late. Some favorite kinds were propagated from suckers, sprouts from roots wounded in plowing. Grafting was early practiced, a bunch of clay wrapped with swinging tow being used to cover the stock. The first use of grafting wax appeared in the thirties.

Injurious insects were not troublesome in those days; in fact, the codlin-moth was little known until 1835.

Mr. Gold’s mother came to Connecticut from central New York in 1819, and never saw a wormy apple until then. The bag worm was then more abundant than in recent years. The canker worm attracted attention in New Haven and vicinity in the thirties, when Mr. Herrick studied their habits and devised means to protect the elms from their ravages. They were truly a frightful pest; one could not walk the streets of that city in their season without collecting samples on his clothing.

The dates of great ice storms, or of exceeding droughts, can be obtained by counting the rings on old forest trees, those in exposed places making growths as thin as paper in several years after such visitations.

Among pears, the Sugar, Orange and even the common “Choke Pear” were then in use. Mr. Gold remembered the introduction of the Bartlett about 1838-40. Seckel and Virgalieu came earlier; the latter sort spotted badly. But they can all be grown now by spraying, as also can the fine Flemish Beauty. A great many new varieties of pears came in soon after the Bartlett.

In Mr. Gold’s early days peaches were very abundant everywhere. But troubles with this fruit began to show themselves, which finally came to be known as peach

yellows. There were many excellent *seedling* peaches. Among others the Blood was highly valued. At that time planting *whole peaches* was thought to produce fruit of the same variety, a theory long since exploded.

Plums were easily grown, and the luscious fruit was freely given away. There was no black-knot or other trouble to contend with. The Damsons were justly prized then, and even nowadays this old sort is unsurpassed for preserving. The strawberry was not grown or marketed much until 1834-40. It was introduced into New Haven markets by the late C. P. Augur, of Whitneyville, who, as a boy, supplied New Haven at that time.

The raspberry and blackberry (cultivated sorts?) were of more recent introduction.

The sweet pea is an old flower favorite, a craze for which has revived in recent years; also the asters, pinks, poppies, peonies, lilacs, etc., were common in old gardens. Nearly every one grew their own garden seeds in those early days of horticulture.

The tomato came some time between 1830 and 1840. At first people hardly dared to eat it, and the still unsolved question was then asked, "Is it a fruit or vegetable?"

Mr. Gold referred to some of the well-known men connected with horticulture fifty years ago, and spoke interestingly of his associations with A. J. Downing,—took his famous paper, "The Horticulturist," from the beginning; Grant Thorburn, the old Scotch gardener; Charles Downing; Hovey, of Boston; Marshall P. Wilder and the early days of the American Pomological Society; Dr. Hoskins, of Vermont; J. J. Thomas and the "good" Dr. Grant, of Iona Island grape fame.

The Isabella was *the* grape seventy years ago. He also spoke of Mr. Bull and his introduction of the Concord grape. In 1840 grape culture under glass succeeded well and was profitable.

There were fine horticultural shows in those days, fifty years or more ago, in New Haven, Hartford and other cities. The exhibits in the old statehouse at New Haven were very fine and attracted great attention. The leading citizens took great interest in fruits and flowers, notably

Dr. Eli Ives, Nathaniel Bacon, Charles Robinson and Prof. Benjamin Silliman. A horticultural club met monthly at the residence of different members to test fruits and discuss culture, etc. At the same time there was in Hartford a similar spirit, and Judge S. H. Huntington, John M. Niles, David Clarke and Mrs. Sigourney are recalled in this connection; also Dr. G. W. Russell, who is still with us and enjoys horticulture as much as he ever did in his younger days.

In fact, the love of trees grows with age, for they are the only living associates of our boyhood. The names of Henry Dyer and Rev. Wm. B. Clift (Tim Bunker) must not be omitted here.

Among the early promoters of the love of flowers I recall with pleasure the memory of Mrs. Joseph Battell, of Norfolk; Deacon Edwin Newbury, Rev. R. Camp, of Brooklyn, Conn., and many others, for the fragrance of their example still holds sway in their several communities.

In closing, Mr. Gold gave a very interesting comparison of old and new methods in fruit growing. The entire address was heard attentively and much enjoyed.

WORK AND RESULTS AT FRUITVALE FARM

By MORTIMER WHITEHEAD, New Jersey

IT will not do for a man in the fruit-growing business to say that he knows it all. All of us should be constantly learning. To stop learning is to be left behind in the race. Such meetings as this are of untold value to the fruit grower.

I began the culture of fruits thirty-two years ago. City life has never had any attractions for me. Its chances for money-making have never lured me from the farm. Today my belief in the happiness to be found in farm life—yes, and the fortune, too—is as strong as ever. I would say to you, brother fruit-growers, have faith in your business and a love for it.

My first ventures in fruit growing were with apples and

pears; later with plums. I prepare my soil very thoroughly by draining and subsoiling before planting.

Between the trees it has been my practice to grow small fruits. At one time sixty acres of strawberries were grown. The matted-row system proved best with me; the hill method is all right, but costs too much.

Seven acres of black raspberries have paid me as well as anything. I aim to grow them as cheaply as possible. The plants are set in rows six or seven feet apart, and eighteen inches apart in the rows. No stakes or wires are used. Grown in this way, the plants make a hedgerow that is self-sustaining.

Blackberries are cultivated in much the same manner and succeed well. The canes are kept headed low.

Currants and gooseberries have paid well in the past, but lately the demand for this fruit has fallen off. The reason for this is, I think, that city people are not putting up these fruits in such large quantities as formerly. They prefer to buy jellies and jams at the store rather than go to the trouble of making their own supply, as formerly.

Of grapes, I grow Concord and Niagara. The Concord succeeds best. Two cents per pound, or about 50 cents per peach-basket at the farm, we consider a good price. But the cost of producing the grapes must be reduced to the lowest point. We have tried the plan of planting vines at the side of our Kieffer pear trees, and with complete success. We keep the trees headed low and the grapes pruned closely; so far there has been no injury to the growth of the trees. The vines can be cut out later on, if necessary.

My apple orchards, for the first twelve years, are cultivated and cropped, then laid down to sod, and are now in half-sod. It would not be well for the trees to leave them too long in sod. Crimson clover is made use of in the orchards. The cutaway harrow is our orchard cultivator. I have found that it will not do to force an apple or pear tree.

For fertilizers, muriate of potash and bone are used. Wood ashes are liked, if they can be had of good quality. The use of ashes about the trunks of apple trees to prevent

borers has not been a success. Washing the trees has been more effectual, especially when combined with digging the borers out once a year.

Among pears, the Bartlett and Kieffer have succeeded best with us. It is a mistake to plant too many varieties for market. I have not been able to grow the Anjou profitably.

Plums can be grown to perfection only by spraying. Among the European sorts, we have Lombard (which has paid us well), Bradshaw, German Prune and Niagara; among Japanese sorts, Burbank, Abundance, Satsuma and Willard. Spraying will prevent both rot and curculio; last season, however, nine sprayings failed to save our crop from rot.

In planting plums we set the trees in rows twenty feet apart and eight feet apart in the rows. This makes a convenient row to drive through in spraying. Other crops are grown along with the trees. This requires thorough intensive culture, but that is just what we aim to give them.

The improved California style "cutaway" works close up to the trees and leaves the soil mulched with a fine dust on the surface, which is of great help in a dry season.

We find that spraying of all kinds pays largely and makes healthy foliage,—a great factor in growing a successful crop of fruit.

Our practice has been to begin cultivation very early in spring and not to continue it late in the summer. After cultivation ceases we sow oats, clover and sometimes buckwheat.

In the discussion which followed the above address, in answer to several questions the speaker said:

That if spraying were done, apple trees should be planted thirty-five to forty feet apart That crimson clover should be plowed-in early in the spring That the market for Japan plums, so far, had been exceptionally good That he put up his fruit in quart baskets, and last season received \$1.62 per crate of thirty-two quarts.

THE RELATION OF FOLIAGE TO FRUIT

By N. S. PLATT

LEAVES are the lungs of plants, and as the lungs in the human body revitalize the blood, fitting it to repair the waste of the system and to build up new portions of it, so the leaves of plants, through the action of air and sunshine, prepare or change the sap that comes up from the roots, making it ready to form wood, flower, leaf, fruit or flavor, and enabling the plant or tree to perfect its natural habit to the fullest degree when other necessary things are also supplied.

We see disastrous results very quickly when foliage is either entirely or largely destroyed. Our elm trees—so vigorous, so strong that up to 1890 one was seldom known to die—now yield to three or four seasons of being denuded by the elm-leaf beetle. A spotted leaf-blight of quince and European plum trees, that causes the leaves to fall by September 1, disables the trees for one or two years and frequently causes their death. We all know how damaging is any blight on annual plants, like potatoes or melons, when the leaves are destroyed or impaired before their mission is completed. The most vicious of weeds may be eradicated, no matter how strong the roots, by simply preventing the leaves from expanding in the air.

There is an intimate relation between the leaves and the roots of a plant or tree. The roots cannot long carry on their functions without the leaves to aid them, and vice versa. Last summer was an unusually wet one, and young roots of many trees were apparently rotted by being covered with water so much during the season of growth. This was shown, I think, by the death of the trees, or portions of them, before the season ended, and by the premature coloring and falling of the foliage.

That veteran gardener and horticulturist, Thomas Meehan, has claimed that the connection between leaves and roots is so intimate that when a portion of the top of a tree is cut away a portion of the roots die. An example which would seem to corroborate this theory has come under my

observation. It is that of some peach trees, five years planted and of large, spreading growth, which were cut back in early spring to within three feet or so of the trunk. They threw out a rank growth of shoots from all over the stubs of branches that were left. A few of the trees died outright the first season, without making growth; a few others were condemned the second and third years for yellows. These were so loose in the soil that, though the trunks were large and the roots *had been* coarse and strong, yet they could almost be turned over by the hand. Most of the roots had died, from no other cause, apparently, than that the tops had been cut off, leaving so few leaf-buds to work up the sap fed them from the roots that the roots died from the shock of such heroic treatment. We see some cases of orchard pruning, or grafting, where the trees are treated much in the same way, the whole or nearly the whole top being taken off at once.

The advisability of such wholesale pruning depends, of course, on what is to be gained by it. It seems to be a fact, however, that unless the leaf supply can be quickly restored, the cutting off of the top also destroys the roots. In orchard pruning we need to guard against cutting away overmuch of the top and destroying the balance between leaves and roots for too long a time; both are needed to form buds and fruit.

How to keep fruit-bearing plants and trees at their best has long been a problem—the greatest problem, I believe, with which we horticulturists have to deal. We have to look in many directions and to keep in mind many things, but I hazard the opinion that none of these many things are more important, or offer greater hopes of success, than the matter of obtaining and retaining perfect foliage till the mission of the leaf is done.

The two most popular tree fruits of today are the peach and the Japan plum, and they have the most perfect and enduring foliage. Delicious, beautiful and abundant are their fruits, but how much lower would a just estimation place them if an unmanageable blight should denude them of their leaves?

European plums, having apparently a tougher leaf, need

help, periodically at least—mine need it every year—in struggling with the shot-hole fungus. The remedy is sulphate of copper in three applications. The first consists of 1 pound of copper to 25 gallons of water (no lime), applied in spray before the buds open; the second application, of 6 pounds of copper and the same quantity of lime in 50 gallons of water, is made when the new growth is 3 to 6 inches long; the third consists of the same solution applied in July, about a month after the second. This treatment in ordinary seasons enables the trees to retain their leaves until frost. It did not do this last season, however, for the unusual rainfall proved too much for it. Bordeaux may be applied up to the time plums are half grown without having it show on fruit at ripening time.

Grapes need a similar treatment, periodically at least. Quinces need it to keep down leaf-spot. Apples, I believe, need more of it than they get.

It has been noted, again and again, that apple trees sprayed with Bordeaux, retaining their foliage thereby, perfected their fruit better, so that it was solid, full-flavored, fine-colored, and adhered to the tree later than when unsprayed. The results do not stop here. Sprayed fruit carries well, keeps well and suits the consumer; in fact, comes pretty near the ideal crop that we strive for. Furthermore, perfect foliage, retained through the full season, not only perfects fruit, but stores up wood and bud material for future use,—material far superior to that formed by the tree with scattered or injured foliage. And here, I believe, may be found the chief cause of that barrenness of tree and sterility of blossom that all through the northern apple belt has been the great bugbear of apple growing. This cause, imperfect or scanty foliage, may be brought on by disease, by starvation and perhaps by other causes.

One September, when I was in central Delaware, a prominent fruit grower there was trying to learn from us northerners how to lay down his Cuthbert raspberry canes to prevent them from winter-killing. Now the climate of central Delaware is probably not so severe as to injure Cuthbert raspberry canes that are in good health very often. The trouble with this man's raspberry patch was that the

canes had shed half or more of their leaves early in September before the wood was ripe and perfect. The retaining of the full foliage would probably not only have carried the canes through the winter unharmed without protection, but would also have given a better crop of fruit the next season.

A good fruit crop of any kind seems to demand good foliage. Is it not being impressed on you fruit growers by past experiences that you will do well to aid your fruit-bearing trees and plants to preserve their foliage, wherever you can, from whatever destroys or injures it? Last summer, as we walked over his grounds, one man said: "I must spray my melons and strawberries next summer; there is no other way for me." Another large strawberry grower manages to burn a part of the winter mulch along with the strawberry leaves, early in spring, to destroy the rust that by breeding becomes so damaging later when the fruit is ripening. It is a case of fighting fire with fire, but he thinks he comes out ahead.

So we must watch and, wherever we can, give aid to foliage; by using fertilizers and cultivation with judgment to produce leaves and growth, by pruning away branches that cannot thrive or that the root cannot support, by using Bordeaux to shield the leaves from fungus and retain them till their mission is done, by keeping off all the insects we can, and by carefully selecting such varieties as not only bear fine fruits, but also have a good leaf system back of it.

In the discussion which followed this paper, President Hale said that better foliage would make hardier fruit-buds. Growers are now learning to cultivate later in the season to secure this result. We no longer believe in stopping cultivation early, if we want a strong development of fruit-buds that will withstand a low temperature.

MR. BUTLER: I have tried continuing cultivation late on peaches and berries, and find it works well.

APPLE POSSIBILITIES IN CONNECTICUT

By EDWIN HOYT

I PROPOSE to give you, briefly, the history of an apple orchard on our farm which I planted just after the war, so that now it is about 30 years old. You shall have the story just as it is, and probably you can learn as much from the mistakes as from the successes.

The start was made by obtaining apple seeds from a seedling tree that possessed the good qualities we desire for stock seedlings, namely, vigor, size, symmetry, productiveness. The stocks grown from this seed were large, strong and well rooted, very much to be preferred to those grown from promiscuous seed. They were four years in the nursery from the time the seed was planted till they were ready for orchard planting.

The trees were planted 30 feet apart each way, in a good, deep, rich loam. The first mistake comes in here: the trees are too thick. The branches of strong growers, like the Greening, began to meet between the rows before they were 20 years old, and now, when they are 30, all the varieties practically cover all the ground, except in the rows of the Wagener, which is a very small tree. Already many of the lower branches have been, or soon will be, shut out from sunlight and air, so that they will die.

Moreover, 30 by 30 feet, or 900 square feet per tree, does not give sufficient room for the root development of a large tree; 40 by 40 feet, or 1,600 square feet per tree, would be about right for well grown 30-year-old trees. If our trees continue growing as they have done, when 40 years old they will need 45 by 45 feet, or 2,025 square feet per tree, two and one-fourth times as much as they now have.

For a mature orchard on rich land, I consider 45 feet the best distance to plant trees. This gives each tree sunlight and air on all sides, ample room for root development and their owner a chance to drive between the rows for spraying and gathering fruit. I know we are advised to plant close, the idea being that a portion of the trees can be cut out later on. Three orchards were set in our town

40 years ago, with the trees a rod apart. The intention of the planter was to take out a portion of the trees, but this has never been done. Neither of these orchards has ever produced much fruit. We did muster up courage enough to cut out alternate trees on one end of our orchard a few years ago, but it seemed hard to cut down healthy, vigorous, bearing trees.

The first ten years after planting, our orchard was cultivated, fertilized and planted with some hoed crop every year. The trees made a luxuriant growth and injurious insects, blights and fungi did not seem to trouble them as in later years, but they produced little fruit. It is a fact that a rapidly growing young apple orchard seldom produces fruit enough to be of much commercial value.

After 10 years' cultivation the trees had grown to good size and shaded much of the ground. It was then seeded to grass and pastured with cattle, the intention being to check the wood growth and throw the trees into fruiting. The orchard remained in pasture 15 years. During this time it had no fertilizer except one light application of ground bone and another of leached ashes. It was fairly profitable during the 15 years it was in pasture, bearing some fruit every year, generally having pretty full crops in the years when apples were plenty and cheap, but in size and quality the fruit did not grade very high; very little of it was fancy. During this time the foliage suffered much from insects and blights, for which spraying seemed to be only a partial remedy.

This way of treating the orchard did not bring as satisfactory results as we wished, so two years ago, in the spring of 1896, we plowed the orchard as shallow as possible and, later, applied a car-load of New York stable manure to the $3\frac{1}{2}$ acres. The orchard was cultivated six or eight times with our orchard harrow, keeping the surface clean and mellow.

The crop of fruit in 1896 was a good one, but the trees had not yet fairly felt the results of the new treatment. Last season, 1897, the same cultivation with the orchard harrow was kept up and another car-load of New York manure applied in June. The cultivation and fer-

tilizing now began to tell; the trees put forth luxuriant foliage and made a large growth. There was a moderate crop on all the varieties except the Baldwin. The fruit was large, handsome and sold for good prices. A trifle over \$400 was realized from the orchard, which contains 150 trees in all, an average of \$2.75 per tree. The promise is good for a crop the coming season, and I expect good results if the present treatment is continued.

There seem to be four things essential to success in the treatment of bearing orchards, namely, cultivation, fertilization, thinning and spraying.

Connecticut is in the apple belt, and, so far as I know, we can produce just as good apples as any section in our land; but to keep up with the times and compete successfully with the fancy fruit sent in from the north and west, we must adopt wise methods.

An easy method of thinning apples was asked for. Some said use a pole; others recommended thorough pruning of the tree.

MR. ALLEN: I have kept my orchards in sod and pastured them with sheep. This plan works well. The sheep destroy many insects. Have applied no extra fertilizer beyond the droppings of the sheep. After orchards are well started this plan succeeds well and is profitable.

MR. WHITEHEAD: I have kept hogs in apple orchards with successful results.

Professor Britton spoke of top-grafting wild seedling apples as resulting in good crops of fruit.

PRESIDENT HALE: This plan can be followed in Connecticut, especially on the very rough hillsides where preparation of the land for planting an orchard is difficult.

Many growers present agreed that the apple is the safest investment in Connecticut orcharding today.

Varieties recommended for planting for profit were Baldwin, Greening and Sutton Beauty.

Mr. Platt spoke a good word for the Wagener apple.

PRESIDENT HALE: I must urge the careful thinning of fruit by hand; it will pay. In addition to thinning, train the tree in the right way, and then we shall have no "off years" in apple growing.

DISCUSSION OF THE QUESTION LIST

Q. Has the repeal of the peach yellows law proved a misfortune or a blessing?

A. Decidedly a misfortune.

MR. WAKEMAN: I have seen more diseased trees in my section the past season than ever before.

Q. Can peach trees be grown so that, with a heavy crop, the branches will not break?

PROFESSOR GULLEY: Head-in the trees, and it can be done.

President Hale called attention to the fact that in Georgia peach orchards the trees carry great crops of fruit without breaking, because they are rightly formed and low headed.

Q. Has any one tried sowing oats in August in peach orchards, either with or without crimson clover?

MR. WHITEHEAD, of New Jersey: Have tried sowing oats with clover; it protected the clover from winter-killing. I used only a light sowing of oats.

Q. Shall we plant grapes for profit in Connecticut?

C. I. ALLEN: Some varieties are profitable. Delaware seldom pays, but Worden and Concord succeed all over the state and will pay a small profit if grown on a large scale.

PROFESSOR GULLEY: Grapes can be grown cheaply, and there is profit in supplying the local markets. Grapes grown near large bodies of water are always of superior quality.

PRESIDENT HALE: Wine grapes are in demand. The Italian people are large consumers, and will pay 1½ to 2 cents per pound for them in bulk, so there is no expense for packages.

Q. Is it a mistake to apply 500 or 600 pounds of muriate of potash per acre to peach orchards?

G. F. PLATT: I have concluded, after 15 or 20 years' experience, that on my farm it is a mistake to apply these large amounts of potash. My soil is underlaid with slate rock, and I believe that this supplies enough available potash for fruit crops. On other farms it may not be a mistake.

J. C. Eddy thought an application of lime necessary where excessive amounts of potash had been used.

MR. BUTLER: Experiments carried out on our farm show that this is too much to apply profitably; 400 pounds per acre gave best results, while 900 nearly killed the trees.

MR. BARNES: Each grower would do well to experiment for himself along this line.

Q. Are there any better peaches in their season than Champion and Early Rivers?

It was the unanimous opinion that there are none better than these.

Q. How long will it pay to run the strawberry bed for home use?

MR. EDDY: I pick from my beds but one season.

PROFESSOR GULLEY: It won't pay to clean out an old bed; plant a new bed every spring.

Q. How many believe that wood ashes are valuable in fruit culture and have made successful trials?

PROFESSOR GULLEY: In New York state they do not believe in ashes. At the experiment station they have been conducting a series of experiments with ashes, and, so far, the results show that ashes have increased the scab in apples.

President Hale recommended the use of ashes in fruit culture.

MR. FORBES: The strawberry growers around East Hartford use wood ashes largely and find them very valuable in making stronger plants.

MR. COLEMAN: I have used ashes on my peach orchards with very gratifying results. Have nothing to say against the use of ashes.

Q. What are the dangers of early winter pruning in comparison with late winter pruning, either in the nursery or orchards.

N. S. PLATT: I would not recommend *early* winter pruning; it reduces the vitality of the trees. Prune in February and March, both in the nursery and in the orchard.

PROFESSOR BRITTON: Healing begins more slowly in the coldest weather, therefore it is better to defer the prun-

ing until later. *How*, rather than *when*, is the important thing in all pruning.

Q. What is the best commercial sour apple between Baldwin and Roxbury Russet?

MR. PLATT: Can recommend nothing. Baldwin still heads the list for keeping qualities. We are not yet sure of the newer varieties. Rome Beauty, Stark, Ben Davis and Gano might be named.

Mr. Whitehead and Professor Gulley both spoke in favor of Rome Beauty. This apple does best on high lands.

Q. Does the use of stable manure on peach trees tend to cause the yellows?

PRESIDENT HALE: I think so, decidedly. The yellows is most prevalent in orchards where highly nitrogenous fertilizers are used and the trees are forced to make too rapid growth.

MR. WAKEMAN: Stable manure will produce fruit of extra size, but at the expense of quality.

Q. Does the hornbeam, or any other wild tree, serve as a host for the peach borer?

N. S. PLATT: I have frequently found borers in hornbeam trees near peach orchards.

PROFESSOR GULLEY: In New York state it is claimed that the borer spends the winter in the mass of gum and sawdust near the base of the tree, and that it can easily be found and destroyed at that season. This valuable point was attested to by several observers.

Q. What is the best wash to prevent borers from entering trees?

PROFESSOR GULLEY: No wash will be entirely successful in keeping out the peach borer. A surer preventive is to bank around the trees in the fall.

President Hale called attention to the advice of Prof. Erwin Smith, the well-known experimenter, who gives the following recipe for a wash: One pint coal-tar and one pound whale-oil soap to two-thirds of a pail of whitewash; add clay to thicken. This wash has been successfully used by many large growers.

(For more recent information on the peach borer, see

special Bulletin No. 176, issued by the Cornell Experiment Station, Ithaca, N. Y.)

Q. Will the small peach grower, with five or less acres of trees, make any money five years from now if he has to depend on local markets for sales?

MR. FENN: The small grower will have less advantage in the markets of the future.

MR. FARNHAM: In local markets the small grower stands equally with the large.

MR. BARNES: They *should* stand together in the local markets and maintain prices.

Q. Is it desirable to plow orchards late in the season, say in November?

MR. ROGERS: I find fall plowing is not desirable; the land washes badly through the winter.

Mr. Whitehead recommended the use of some cover crop and would not plow in the fall.

G. F. PLATT: I do not find it desirable to plow orchards at all after first breaking up the land to prepare for planting; thorough harrowing will answer all purposes.

Q. What plants for green manuring can be successfully grown on Connecticut fruit farms?

MR. PLATT: I am using oats and crimson clover, sowing them in August; am much pleased with this combination so far.

President Hale urged the use of cow peas; they make their best growth through the warm weather, however.

Professor Britton recommended the common red clover.

Q. Are any of the newer implements of cultivation to be recommended?

A. The Morgan grape hoe and the Syracuse spring-tooth cultivator are mentioned as being valuable tools for the fruit grower.

Q. Does it pay the average fruit grower to retail part or all of his fruit to families?

MR. FARNHAM: I think it makes trouble if you sell at both wholesale and retail. Do either one or the other, and protect the trade.

Mr. Sherwood believed in selling through commission men. Find a good man and stick to him. My experience is that a man cannot successfully both grow and sell his products.

Q. Is the San José scale to be feared in Connecticut, and, if so, how can we prevent it from spreading?

PROFESSOR BRITTON: It is to be feared, and has come to stay.

Whale-oil soap, one pound to two gallons of water, was recommended for this pest.

Q. What have we learned the past season in relation to spraying?

PRESIDENT HALE: We need more scientific light and practical experience on the subject before it is safe to do very much with kerosene, which has been so strongly recommended in some other states.

Mr. Allen had found that half-strength Bordeaux is not safe to use on the foliage of Japan plums.

President Hale related his experiences in fighting the brown rot of the peach by spraying with Bordeaux mixture. Diluted even one-fourth, the Bordeaux injured the foliage, and its use had to be abandoned.

MR. IVES: The quality of the lime we use in making Bordeaux is of great importance.

Q. In view of present prices and demand, can we expect currants to be profitable?

MR. BUTLER: No; four to five cents was the average price of currants last season. The outlook for the currant grower is not promising.

Q. What shall we plant for shade trees to take the place of the elm?

Some said plant another elm.

PROFESSOR BRITTON: Plant the sugar maple.

MR. BARNES: Plant the white oak.

MR. WHITEHEAD: I would plant two shade trees for every one that is removed.

Q. Can small fruits or any annual crop be grown in young orchards profitably?

A. Yes; but not to the advantage of the orchard. One thing at a time is a good rule to follow.

MR. SHERWOOD: I grow onions in my young peach orchard successfully.

MR. WAKEMAN: Strawberries and peaches are not a good combination.

Q. What is the best blackberry for the family garden?

A. Eldorado.

MR. MILES: Erie or Snyder, if you want fruit every year.

Q. What are the best winter pears?

A. Lawrence, Dana's Hovey and Winter Nelis.

Mr. Whitehead would add Kieffer to the list; others objected.

MR. BARNES: The Lawrence pear succeeds well on the lighter soils, is of good quality, and keeps well.

Q. When peach trees become old and the branches long, how can we shorten them in successfully?

MR. BARNES: It can be done with the saw; cut back the top severely. Massachusetts peach growers claim that this treatment will also cure the disease known as yellows.

SECRETARY MILES: This is not true for Connecticut, and no one here believes that it is really true in Massachusetts.

Q. What are the best market strawberries for light soil?

A. Bubach and Haverland.

Q. What is the best style of wagon for transporting fruit to market?

A. A platform spring wagon of any make with a low-down body.

President Hale recommended the Dunkirk wagon (one-horse) for hauling fruit out of the orchard. The "Handy" wagon is the best low-down wagon on the market.

Mr. Sherwood explained a wagon in use on his farm with drop sides and ends. It was found very convenient in loading and unloading.

Q. What are the best extra early peaches?

PRESIDENT HALE: Sneed and Triumph. These are half-cling sorts, but good ones for extra-early family supply.

CHESHIRE INSTITUTE (1898)

AN INVITATION was accepted from Cheshire Grange to hold an institute in that town, March 23, 1898. There was a good attendance of farmers and fruit growers and a lively interest was shown in the subjects under discussion.

After an address of welcome by Chas. T. Hotchkiss, Master of the Grange, both Grange and Society listened with great interest to the following paper:

OUR INSECT ACQUAINTANCES

BY PROF. W. E. BRITTON

To the fruit grower the study of insects is a question of economy, pure and simple. He is interested in entomology only so far as the insects help or hinder him from obtaining a crop of fruit. The average grower probably looks upon ninety-nine out of every hundred insects as his enemies. They are robbing him. He will almost invariably destroy them when he finds them, and yet will often take no other measures toward forestalling their injury. In this way he is quite as likely to destroy beneficial as injurious species, and the result is scarcely extensive enough to be of much importance either in aiding or hindering the advancement of his business.

We all know far too little about some of our common species of insects. Their life-histories were worked out perhaps fifteen or twenty years ago, and we are quite willing to take these accounts as authoritative, though the insects in question may have changed their habits considerably in a score of years.

It was formerly supposed that the codlin-moth always laid its eggs in the calyx of the apple about the time that the blossoms fall, and this has been taught for years. This insect was named by Linnaeus in 1758. It has been known in Europe for centuries, but its real history dates from 1635. About eighty years ago the first account of the insect in America was published, and an American was the first to suggest a treatment for controlling the insect.

Much has been written abroad about the codlin-moth, and far more in this country. It has an enormous literature. Notwithstanding the fact that the species has such an important bearing upon fruit growing, in all of these writings, according to Slingerland, not a single author mentions, or probably ever saw, the egg stage, which was first figured by Washburn in 1893.

In 1896 and 1897 Slingerland and Card made careful observations, which show that the eggs are not laid until at least a week or more after the blossoms have fallen. Instead of being deposited in the calyx of the apple, as had been supposed, they are almost always laid elsewhere.

The young caterpillar hardly ever enters the fruit at the point where the egg had been laid—and nearly 75 per cent of them do enter at the blossom end, either in or near the calyx.

I have mentioned this to show that we have still many things to learn about our common species of insects. There is great need of more observations carefully made. No one has so good a chance to make observations regarding fruit insects as the fruit grower.

Last season injured peach twigs were submitted to me by one of our members, Mr. Rogers, of New Britain. The new growth had been punctured in longitudinal rows by a small dark brown beetle, specimens of which were still at work. It was the well-known apple curculio. Mr. Rogers states that about a dozen young peach trees were injured to such an extent that they died from the effects. In a letter Mr. Howard, of Washington, D. C., informed me that this is the first instance on record of this species having attacked the peach. Such observations are sure to be of value.

There is an opportunity for this Society to do an immense amount of work along this line. The state of Connecticut is well supplied with a large number of insect species. Some of them are liable to become injurious where they are not so at present. Injurious species are apt to change their feeding habits. The Society has an Insect Committee, and if each member of the Society will report observations on insects to the committee, we will try and see that all notes of value are embodied in the annual report of the committee for publication in its annual reports.

M. B. Waite, of the United States Department of Agriculture, conducted some experiments a few years ago, which show that a large number of our common varieties of pears and apples are sterile unless the flowers are fertilized by pollen from different varieties. The Vermont Experiment Station has recently demonstrated that the Japan plums are also self-sterile.

The whole philosophy of spraying against insect attacks is based upon insect anatomy. The mouth parts of the insect must be examined; if he has jaws he is recorded at once as an eating insect, and Paris green is prescribed and sometimes applied. But in case we find the bug furnished with a sharp tube-like proboscis through which he sucks the plant juices as food, then we must look for a different remedy. It is of no use to give him Paris green, for he cannot eat it. Fortunately nearly all the sucking insects have soft and delicate bodies, so that we can kill them by bringing some caustic substance in direct contact with them. Strong soap-suds is a good insecticide of this sort, and if made from the whale-oil or fish-oil soap, so much the better. Kerosene emulsion is also a standard remedy.

There is another class of insecticides, however, that will kill any insect—no matter to which order it belongs. All insects require air; they breathe, as we do. The treatment therefore is to enclose the insects or the infested plants in a tight box, and generate some poisonous gas that will kill them by suffocation.

Since the arrival of the Colorado potato beetle probably no insect has been the subject of so much discussion and attention as the San José or pernicious scale. We have been accused of creating a useless

"scare" over an ordinary sort of insect. Be this as it may, some good has come from it. Every fruit grower is now examining his trees as he never did before. Whether or not he finds the scale, he will probably discover other injurious insects in time to forestall injury. If we could have the "scare" without the scale, it would be one of the best things that ever happened to New England fruit growers. But we have the scale, and it is well distributed over the state. In all probability it is here to stay, for the average grower will hardly be able to exterminate it when once it has become established in his domain.

Kerosene, in the form of a spray, has been used against the scale in New Jersey with good results. It has also been given a trial in Connecticut. On February 28, several trees on the grounds of the experiment station at New Haven were sprayed with kerosene. It was a bright day, with some air stirring, and the application was made about two o'clock in the afternoon. The liquid was forced through a bucket pump in the finest spray that could be obtained with a Vermorel nozzle. Peach, apple, pear, quince, Japan plum and viburnum trees were treated, though not infested with scale. At this time (March 21) no perceivable injury has resulted. Two Japan plum trees in New Haven, which were badly infested, were sprayed at the same time. I have not yet been able to examine them, but there is no doubt that kerosene will kill the scale. It must not be used except on a bright day, when evaporation will be rapid, and must be applied in the form of a *very fine spray*.

A safer treatment, however, is to spray the trees with whale- or fish-oil soap. Two pounds of soap to one gallon of water are the proportions to be used when the tree is not in foliage. One trouble with the fish-oil soaps on the market is that they are not uniform in composition and often will not dissolve. Two soaps that may be obtained, however, are considered very uniform, and for that reason are to be recommended. One is the potash soft soap, made by James Good, 514-518 Hurst street, Philadelphia. This sells in quantity for $3\frac{1}{2}$ cents a pound. The other is known as the Leggett Anchor Brand. It is a hard soap and should first be dissolved with hot water and then diluted with cold. This soap is manufactured by Leggett & Brother, 301 Pearl street, New York; it sells by the barrel for 4 cents per pound.

Kerosene is probably more effective than whale-oil soap, because it reaches into all the cracks and crevices, so that it is more likely to come in contact with every individual scale than the soap.

There are three species of scale-insects which the Connecticut fruit grower may now run across, either of which is quite liable to be found anywhere in the state. These are the San José scurfy bark-louse, the San José scale and the oyster-shell bark-louse. These can easily be distinguished on account of the shape. The oyster-shell bark-louse is shaped very much like the shell of an oyster,—hence its name. It is long and usually the same color as the bark of the tree upon which it is found. The scurfy bark-louse is larger than the species just mentioned, and is broader according to its length. It is pear-shaped. The male scale is much smaller than the female and is narrow, with sides nearly parallel.

So far as my observation goes this scale (the scurfy bark-louse) is always of a light gray color, which makes it very conspicuous against the dark-colored bark. The San José or pernicious scale is much smaller than either of the other two, and is distinctly circular in outline. Its color is dark gray, though it often appears nearly black upon the bark. It is convex, with a slight projection or nipple in the center, which is black. Often half-way from this nipple to the edge of the scale is a grayish ring or band concentric with the general outline. It is very easy to distinguish the San José scale from either of the other two which I have mentioned, but the trouble lies in the fact that the scale is so very small that it is likely to escape notice until the tree is badly infested and begins to show signs of weakening.

There is a circular scale in Connecticut,—and probably it can be found in almost every currant patch,—which so closely resembles the pernicious scale that it requires an expert entomologist with a compound microscope to tell them apart. This is known as Putnam's scale (*Aspidiotus aenylus*). But, so far as I know, it occurs here only upon the currant, and is not sufficiently abundant to do much injury; so that if a scale of this description is found on anything but a currant, one may be tolerably sure that it is the pernicious scale. If any sort of a circular scale is found on a currant it should at once be sent to an expert, for it may be either species.

I believe we must still continue to use great vigilance and persistence in examining our orchards and nurseries, and in applying treatment in case the scale is found. Waiting for natural enemies to appear is, after all, a lazy man's practice, and we do not want that sort of thing among the members of the Connecticut Pomological Society.

J. C. Eddy, of Simsbury, opened a discussion on "The Growing and Marketing of Small Fruits," giving an account of his methods of handling the strawberry, as follows:

The plants are set when the soil is dry, using a machine planter which waters and sets the plants at one operation. This plan succeeds, and the plants grow well. As soon as possible after setting, he begins cultivation, using a Breed's weeder and cultivating quite shallow. The weeder has curved teeth and does not injure the young plants. A ton of complete fertilizer is used to the acre, in the course of several applications. A fertilizer containing $3\frac{1}{2}$ per cent of nitrogen, 10 per cent phosphoric acid and 7 to 10 per cent of potash, is a good one to use for strawberries. The plants are cultivated thoroughly all through the season, *not deep but often* being the rule. Spraying with Bordeaux for the blight was advised, using a barrel pump and about twenty-five feet of hose.

"In a dry season irrigation has shown a profit of \$350 per acre. The fruit is picked early in the morning while dew is still on ; also after three or four o'clock in the afternoon. The berries are put into the crates quickly and covered from the air. Cold storage has not proved successful with berries, perhaps on account of excessive moisture."

Mr. Eddy believed in packing berries honestly. "Do not crowd them upon a market already overloaded. Cater to the fancy trade and study the wants of the consumers. Strive to give them just what they want."

C. I. Allen, of Terryville, continued the discussion. His methods and conditions differ from those of Mr. Eddy. Late varieties are the most profitable with him. He recommended Bubach, Parker Earle, Jessie, Gandy, and the Michigan.

Mr. Allen also said that he had succeeded with grapes for market. He grows them on high land, planting them in rows eight feet apart and training on wire trellises. The market for grapes is right at hand for the Connecticut grower, which is an advantage we have over the New York growers.

In answer to a question, Mr. Allen said that we can successfully compete with the grapes from western New York if we will raise better varieties and put them on the market in quantity and of superior quality. Among varieties he mentioned Niagara as very profitable, Worden as good, also Delaware, Pocklington, Brighton, Lindley and Moore's Early ; Campbell's Early he thought a promising new grape.

N. S. Platt spoke a good word for the gooseberry, and urged its extended cultivation. It ought to be a profitable fruit to grow, but only well-grown, thoroughly ripe fruit should be put on the market. Industry, Columbus and Red Jacket were recommended as being good varieties.

M. N. Wooding, of Hamden, said he had found currants very profitable. Fay and Victoria are favorite varieties with him. Fay brings the highest prices. He uses high grade complete fertilizers, and also liberal amounts of ground bone. White hellebore in solution he had found a sure remedy for the currant worm. Mulching had proved a good practice, which takes the place of cultivation to a certain extent. Pruning currants consists chiefly in cutting out the old wood.

At the opening of the afternoon session the contents of the Question Box provoked a lively discussion.

“Stirring the Soil” was the subject of a very practical address by President J. H. Hale, who said, in part:

“This is one of the most important operations in agriculture, — more important, even, than applying plant-food, because stirring the soil sets free so much of the plant-food already in the soil. In New England we have frosts to stir and break up the soil, which is a great advantage and one not enjoyed by all sections. Frosts help to release much plant-food, and thorough cultivation following makes this plant-food available. Underdraining is often of great use in aërating the soil.

“There is a right and a wrong way to plow. The right way is to turn over *all* of the soil. The idea of stirring the soil is to separate the soil particles and help to retain moisture by creating ‘a dust mulch.’

“There is no *one* best implement for cultivating: all kinds have their value. Use fine-toothed tools whenever possible. The new weeders are excellent tools.

“Stirring the soil means success, especially in a season of drought, when the stirring will result in larger and finer fruit crops.”

“The Outlook for Orcharding in Connecticut” was discussed by Geo. F. Platt, of Milford; J. N. Barnes, of Yaleville; A. C. Sternberg, of West Hartford, and others. The general opinion was that orcharding, especially of apples, will give good returns for capital invested; that it is not going to be overdone just yet; that lower prices for orchard fruits must be expected as competition increases, but that growers must aim to reduce cost of production, which can be done and still maintain high quality.

The closing address of the day was by Dr. W. C. Sturgis, on “Spraying Apparatus.” This was of a most practical nature, covering many questions as to the best pumps, nozzles, etc., for the fruit growers’ use. “Get the best apparatus you can find in order to do successful spraying,” was the Doctor’s advice.

Questions and informal discussions rounded out a very interesting and instructive meeting.

FIRST GENERAL FRUIT EXHIBITION (1898)

AT Wallingford, October 13, 1898, in connection with a special meeting of New Haven County *Pomona* Grange, was held the first general fruit exhibition of the Society. The exhibit comprised some one hundred and twenty-five entries of very choice fruit. The handsome appearance, beautiful color and superior quality of the specimens shown were a surprise to many, who had not awakened to the possibilities of Connecticut's fruit farms.

ENTRIES AND PREMIUMS

GENERAL COLLECTION OF FRUITS, 29 VARIETIES.

E. C. Warner, North Haven. First premium, \$10.

APPLES

BEST 25 VARIETIES OF APPLES.

E. M. Ives, Meriden. First premium, \$10.

BEST COLLECTION OF 15 VARIETIES OF APPLES.

Connecticut Agricultural College, Storrs. First premium, \$7.

S. G. Cook, Branford. Second premium, \$4.

E. M. Ives, Meriden. Third premium, \$2.

C. I. Allen, Terryville.

BEST 12 VARIETIES OF APPLES.

Connecticut Agricultural College, Storrs. First premium, \$6.

BEST 10 VARIETIES OF MARKET APPLES.

Connecticut Agricultural College, Storrs. First premium, \$7.

E. M. Ives, Meriden. Second premium, \$4.

Connecticut Valley Orchard Company, Berlin. Third premium, \$2.

BEST SINGLE PLATES OF APPLES.

Baldwin.

Dennis Fenn, Milford.

J. N. & J. R. Barnes, Yalesville.

W. E. Waller, Plattsville. Second premium, 50 cts.

George F. Platt, Milford.

D. N. Clark, Woodbridge.

Connecticut Agricultural College, Storrs. First premium, \$1.

Butler & Jewell, Cromwell.

J. H. Merriman, Southington.

C. I. Allen, Terryville.

E. M. Ives, Meriden.

H. C. Morse, Centerville.

Roxbury Russet.

Dennis Fenn, Milford.
S. G. Cook, Branford. Second premium, 50 cts.
D. N. Clark, Woodbridge.
Connecticut Agricultural College, Storrs.
Butler & Jewell, Cromwell.
C. I. Allen, Terryville.
E. M. Ives, Meriden. First premium, \$1.

Rhode Island Greenings.

Dennis Fenn, Milford.
W. E. Waller, Plattsburg.
George F. Platt, Milford.
Connecticut Agricultural College, Storrs. Second premium, 50 cts.
A. G. Gulley, Storrs. First premium, \$1.
C. I. Allen, Terryville.
E. M. Ives, Meriden.
H. C. Morse, Centerville.

Ben Davis.

S. G. Cook, Branford. First premium, 50 cts.

Pewaukee.

S. G. Cook, Branford. Second premium, 25 cts.
D. M. Clark, Woodbridge.
Connecticut Valley Orchard Company, Berlin. First premium, 50 cts.

Northern Spy.

J. N. Barnes, Yalesville.
Connecticut Agricultural College, Storrs.
Butler & Jewell, Cromwell.
C. I. Allen, Terryville.
E. M. Ives, Meriden. Second premium, 50 cts.
H. C. Morse.
S. G. Cook, Branford. First premium, \$1.

Fallawater.

J. N. Barnes, Yalesville. Second premium, 25 cts.
C. I. Allen, Terryville. First premium, 50 cts.

Hubbardston.

J. N. Barnes, Yalesville. Second premium, 25 cts.
Connecticut Agricultural College, Storrs. First premium, 50 cts.
C. I. Allen, Terryville.
G. F. Platt, Milford.

Peck's Pleasant.

George F. Platt, Milford.
J. N. & J. R. Barnes, Yalesville. Second premium, 50 cts.
Butler & Jewell, Cromwell.
C. I. Allen, Terryville.
E. M. Ives. First premium, \$1.

Birdseye Sweet.

George F. Platt, Milford.

Hurlbut.

Connecticut Agricultural College, Storrs. First premium, \$1.
E. M. Ives, Meriden. Second premium, 50 cts.
C. I. Allen, Terryville.

Red Canada.

Connecticut Agricultural College, Storrs. First premium, 50 cts.

Hallock Sweeting.

S. G. Cook, Branford. First premium, 50 cts.

Princess Louise.

George F. Platt, Milford.

Coggswell.

Connecticut Agricultural College, Storrs. First premium, \$1.

Sutton Beauty.

Connecticut Agricultural College, Storrs. First premium, \$1.

Fameuse.

T. S. Gold, West Cornwall.

Long-Stem Sweet.

Connecticut Agricultural College, Storrs.

Porter.

T. S. Gold, West Cornwall.

Gillyflower.

Butler & Jewell, Cromwell. Second premium, 25 cts.

C. I. Allen, Terryville. First premium, 50 cts.

King.

Butler & Jewell, Cromwell.

C. I. Allen, Terryville. First premium, \$1.

Belle Bonne.

J. H. Merriman, Southington.

C. I. Allen.

Ramsdell Sweet.

C. I. Allen.

Wagener.

C. I. Allen. First premium, 50 cts.

Fall Russet.

C. I. Allen.

Twenty Ounce.

C. I. Allen.

Princess.

H. C. Morse, Centerville.

English Russet.

C. I. Allen, Terryville.

Colvert.

Connecticut Valley Orchard Company, Berlin. First premium, 50 cts.

PEARS

Kieffer.

S. G. Cook, Branford. First premium, 50 cts.
 Connecticut Valley Orchard Company, Berlin.
 E. M. Ives, Meriden. Second premium, 25 cts.

Howell.

Connecticut Agricultural College, Storrs. First premium, \$1.

Seckel.

H. C. C. Miles, Milford. Second premium, 50 cts.
 Butler & Jewell, Cromwell. First premium, \$1.

Anjou.

Connecticut Agricultural College, Storrs. First premium, 50 cts.
 E. M. Ives, Meriden. Second premium, 25 cts.

Clairgeau.

Butler & Jewell, Cromwell. First premium, \$1.
 E. M. Ives, Meriden. Second premium, 50 cts.

Sheldon.

E. M. Ives, Meriden. First premium, \$1.

Lawrence.

Butler & Jewell, Cromwell. Second premium, 50 cts.

Goodale.

T. S. Gold, West Cornwall.

Leconte.

E. M. Ives, Meriden. First premium, 50 cts.

QUINCES

SINGLE PLATES OF QUINCES.

Orange.

C. I. Allen, Terryville. First premium, \$1.
 G. F. Platt, Milford. Second premium, 50 cts.

Champion.

H. C. C. Miles, Milford. First premium, \$1.

Meech Prolific.

H. C. C. Miles. First premium, \$1.

GRAPES

BEST COLLECTION OF GRAPES, 12 VARIETIES.

C. I. Allen, Terryville. First premium, \$7.

SINGLE PLATES OF GRAPES.

C. I. Allen, Terryville.

Moore's Early. First premium, 50 cts.
 Diamond. First premium, 50 cts.
 Worden. First premium, \$1.
 Jefferson. First premium, 50 cts.
 Catawba. First premium, 50 cts.

Lindley. First premium, \$1.
 Ulster Prolific. First premium, 50 cts.
 Empire State. First premium, 50 cts.
 Woodruff Red. Second premium, 25 cts.
 Pocklington. First premium, 50 cts.
 Niagara. Second premium, 50 cts.
 Massasoit. First premium, 50 cts.
 Concord. First premium, \$1.
 E. M. Ives, Meriden.
 Clinton. First premium, 50 cts.
 Albert Plant, Branford.
 Niagara. First premium, \$1.

PEACHES AND PLUMS

SINGLE PLATES OF PEACHES AND PLUMS.

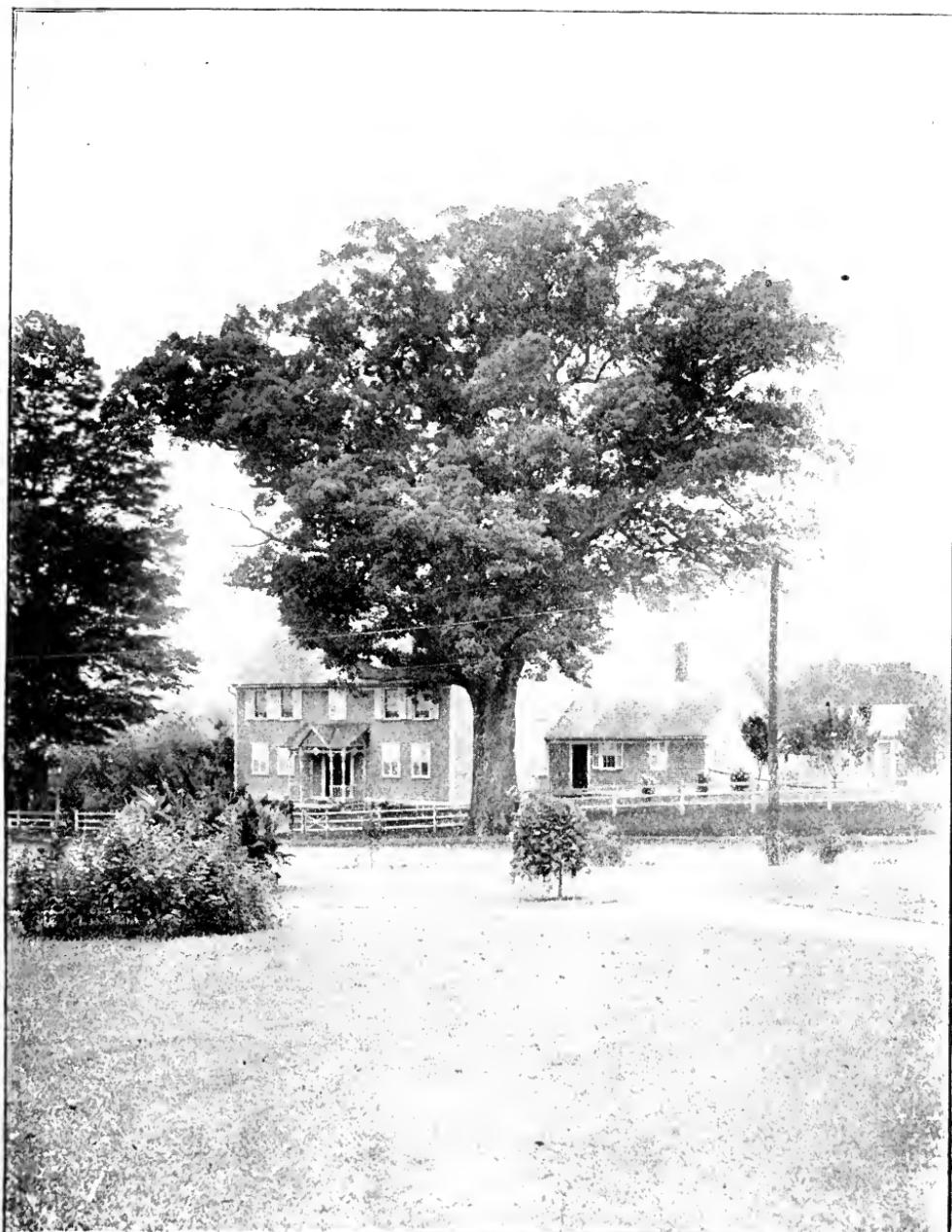
W. M. Tyler, Waterbury.
 Smock. First premium, 75 cts.
 Globe. First premium, 75 cts.
 Morris White. First premium, 75 cts.
 Late Rareripe. First premium, 75 cts.
 Salway. First premium, 75 cts.
 E. M. Ives, Meriden.
 Keyport White. First premium, 75 cts.
 C. I. Allen, Terryville.
 Reine Claude Plum. First premium, 75 cts.

SPECIAL PREMIUMS

J. H. Hale, South Glastonbury.
 Hale Chestnuts, 1 plate. First premium on chesnuts, \$3.
 McFarland.
 Early Reliance.
 1 plate evaporated peaches. First premium, \$1.
 N. N. King, Thompsonville.
 Grape juice. First premium, \$1.

As a pleasant close to this meeting, members of the Society and others were invited to participate in the exercises of the afternoon session of Pomona Grange, which was in charge of the Worthy Pomona and devoted largely to fruit topics.

A vote of thanks was extended to Wallingford Grange for their co operation and the hospitalities extended to the Society.



THE GREAT OAK OF GLASTONBURY.



THE CONNECTICUT VALLEY.



THE OLD HOLLISTER HOUSE AT SOUTH GLASTONBURY.

Built prior to 1660, still occupied, and in a good state of preservation.

EIGHTH ANNUAL MEETING (1899)

THE eighth annual meeting of the Connecticut Pomological Society was held in Jewell Hall, Hartford, February 1 and 2, 1899.

President J. H. Hale called the meeting to order at 10 o'clock Wednesday morning. There was a very large attendance, and both the interest and attendance continued through all the sessions.

PROGRAMME

WEDNESDAY, FEBRUARY I

Morning Session

Annual Address of the President.

Report of the Treasurer.

Report of the Secretary.

Report of the Standing Committee on Business and Legislation.

J. C. EDDY, Chairman

Report of the Committee on Injurious Insects

Prof. W. E. BRITTON,

Conn. Experiment Station, New Haven

How Can New England Apple Growers Successfully Compete

with Other Sections? EDWIN HOYT, New Canaan

Afternoon Session

Orcharding on the Hill Farms of New England

J. W. CLARK, North Hadley, Mass

The Successful Cultivation of the Peach and Other Orchard

Fruits ROLAND MORRILL,

Pres. Michigan Horticultural Society

The Problem of Over-Production . . A. C. STERNBERG, West Hartford

The Latest Concerning the San José Scale

Prof. H. A. BALLOU, Storrs College

Evening Session

Some Lessons from Our First Annual Fruit Exhibit

Prof. A. G. GULLEY,

Horticulturist, Storrs College

Planting to Increase the Attractiveness of the Home. (Illustrated

lecture) ERNEST F. COE, Landscape Architect, New Haven

Pruning and Care of a Peach Orchard. (Illustrated with lantern

slides) ROLAND MORRILL, Benton Harbor, Mich.

THURSDAY, FEBRUARY 2

Morning Session

Influence of Rainfall upon Parasitic Fungi . Prof. BYRON D. HALSTED,
New Jersey Experiment Station

Conditions that Influence the Setting of Fruit N. S. PLATT,
State Pomologist

What Are the Apparent Results of the Repeal of the Peach
Yellows Law . . Discussion, opened by J. NORRIS BARNES, Yalesville
(Prof. Halsted will tell of the New Jersey experiences.)

Afternoon Session

Annual Business and Election of Officers.

Report of the Committee on New Fruits.

Fertilizers in Fruit Growing Dr. E. H. JENKINS,
Vice-Director Conn. Experiment Station

Small Fruit Culture: What Can Growers Do to Improve Market
Conditions? . . Discussion, opened by J. C. EDDY, Simsbury; G. S.
BUTLER, Cromwell; W. H. MANSFIELD, West Hartford.

THE PRESIDENT'S ADDRESS

In his annual address President Hale congratulated the Society on its continued growth and prosperity, and said, in brief, that its work was tending to show the farmers of Connecticut that this was essentially a fruit-growing state, and that in the near future its fruit crops would be of greater commercial value than all the other crops now being grown. The soil of Connecticut is capable of producing all the deciduous tree fruits and small fruits in highest perfection. Extreme climatic changes of winter are the most serious drawback.

The winter of '98 had proved to be the most favorable one for fruit-buds in many years. There was a wonderful amount of bloom on all trees and plants in the spring, but weeks of warm, rainy weather during this blooming season not only blasted the great majority of the flowers, but where the fruit had set, caused it to rot in its green, immature state soon after forming. As a result the fruit

crop of '98 had been almost an entire failure, except in the case of small fruits, which had been more than usually abundant, not only here, but in adjoining states. The markets were flooded with them, at prices lower than ever had been known before—conditions that are not likely to exist again during the lifetime of the members of this Society, so that there is no necessity for any discouragement whatever.

What apples there were in the state last season proved to be of poor-keeping quality and had not marketed satisfactorily.

The Connecticut public is an appreciative and buying one, and the increasing demand for fine fruit constantly kept ahead of the increase in population. Even at the low price of small fruit in '98, growers received greater net returns than from the other average farm crops of the state. That the general line of fruit culture is far more profitable than other branches of agriculture is evinced by the fact that in any section of the state where fruits are profitably grown, adjoining lands of similar character, when put upon the market for sale, command for fruit purposes three and four times the price paid for those wanted for general agriculture.

No branch of fruit culture is receiving more attention at present than the long neglected apple. For the first century and a half in the settlement of our country, the apple was planted entirely for the purpose of cider making. In later years a moderate supply of standard varieties was planted for home use, the surplus being sold in the market, but only within very recent years has any considerable attention been paid to this crop as a specialty of great commercial value.

Acres upon acres of so-called "abandoned farm lands" in Connecticut, if planted in good varieties of red winter apples might easily be made to earn dividends on land value of \$1,000 per acre, and yet such lands are now on the tax list at prices ranging from \$5 to \$15 per acre. In the market, just then, a bushel of good apples would sell for as much as two bushels of wheat, and yet to produce a dollar's worth of wheat would take thirty times as much

plant-food out of the soil as it would to produce a dollar's worth of apples.

Fruit farmers have been using too much commercial fertilizer and not enough of tillage in their soil to bring out best results. More frequent and thorough plowing and constant stirring of the soil, with tools most suitable to the purpose, will produce a vigorous tree and plant, and a beauty and quality of fruit not to be obtained in any other way at so small a cost.

The tendency of the times is toward fruit of greater beauty and higher quality, and yet fruit growers must not look for any higher prices in the future. Other productions of the farm may increase slightly in value during the next few years, but fruit, having always sold higher in proportion to cost, is not likely to reap the benefit of any present or prospective reaction. If there are any increased profits in the business they must come through more intelligent and cheaper production, rather than from higher prices.

Insect pests and fungous diseases continue to increase, but the scientific knowledge given out by the experiment stations and the practical work of the more progressive growers indicate that with right spraying, intelligently and frequently applied, there will be little trouble in keeping ahead of most of these pests. Since the repeal of the peach yellows law, the disease has continued to spread in every section of the state, especially in the smaller orchards and private grounds, as there is no known remedy for the disease, and it spreads rapidly where neglected.

The only safety is to pull out and burn all diseased trees as soon as discovered ; and as the state has ceased to give the protection it ought, we must fight it out among our neighbors as best we can. It is hoped and believed that legislation will again take the matter in hand and accomplish good work, as is being done in Michigan and some other states, through compulsory destruction of the diseased trees.

The cold wave of January 2d caused more damage than was first supposed. Careful investigations all over the state showed that a large percentage of the buds of sweet cherries

and peaches were killed. European plums were somewhat injured, but, so far, there was no apparent injury to Japanese plums, apples, pears or sour cherries.

Fungous diseases of all kinds had been unusually prevalent, because of the warm wet weather that continued through much of the growing season, and the excessive amount of rain had made it impossible to accomplish much by spraying. The matter of maintaining strong, healthy foliage upon all trees and plants was strongly urged; this could best be brought about by frequent and thorough cultivation, intelligent fertilizing and spraying. It is also well to keep up cultivation rather later in the summer than had been the custom in the past, for it was noted that where the fruit-buds usually carried best through winter, they were on trees kept in vigorous foliage latest in the season.

The general falling of prices of fruits in our markets should stimulate greater production at less cost, if this can be done without lowering the standard of our fruits. In the matter of fruit-packages, increasing quantities of fruit should stimulate cultivators to study the demands of individual families, and, so far as possible, to market fruits in packages of the largest possible size that would sell to families in unbroken lots; in this way greater consumption of fruit would be encouraged.

Increased attention to fruit-culture, stimulated by the work of this Society, is increasing the value of all farm lands suitable for fruit-planting. While we are making much of peaches and Japanese plums, the apple is really the fruit of greatest commercial value, and can be grown profitably on a greater area of land than any other of our standard fruits. As to the size, beauty and high quality of Connecticut apples, President Hale referred to the recent fall exhibition of the Society, the influence of which would result, he felt sure, in the planting of many thousands of apple trees in the state.

THE TREASURER'S REPORT

Treasurer R. A. Moore presented his annual report, showing the financial condition of the Society to be very gratifying:

Summary of Treasurer's Report Since the Organization of the Society

RECEIVED	PAID
1891	\$ 50 00
1892	12 00
1893	45 00
1894	68 00
1895	89 00
1896	110 00
1897	163 00
1898	246 03
1899	773 23
	<hr/>
	\$1,556 26
1891	\$ 19 17
1892	31 78
1893	52 62
1894	17 50
1895	34 30
1896	111 65
1897	127 85
1898	127 85
1899	551 02
	Balance in Treas. .
	<hr/>
	\$1,556 26

THE SECRETARY'S REPORT

Mr. President and Fellow Members:

As we come together at this our eighth annual meeting, it is most gratifying to note the increasing interest taken in the work of this Society by those who are engaged in the culture of fruits for home or market.

Despite the fact that the year just closed was a most unsatisfactory one to the fruit-growers of the state, yet, for our Society, it was a prosperous one. Financially, we are stronger than ever before; our membership has increased, and all the meetings have attracted wider attention, especially among those who before knew nothing of this organization and its advantages.

A year ago our total membership was 151. In the year just closed we have added 44 new names, but all our old members have not renewed their membership and several deaths have occurred, so that our gain for the year has not been very large. However, we are holding our own, and today I can report a total membership of 159.

In this connection let me say that probably the best

incentive to keeping our full membership from year to year will be the publication of our proceedings, which, of course, would be issued only to paid members.

From February 1, 1898, to February 1, 1899, I have received and turned over to the Treasurer the sum of \$144, and have drawn orders for the payment of bills to the amount of \$127.85. Our receipts have been further increased by the payment of the state bounty on account of the annual fruit exhibition, so that the Treasurer is able to report a snug balance in the treasury.

In 1898 the Society held six meetings, including the annual one in February. Also two institutes: at Southington, January 21, with Union Grange, and one with Cheshire Grange, March 23, both very successful affairs.

The first field meeting of the season was held August 23, on the large market-garden farm of A. N. Farnham, at New Haven. Over 150 members and their friends accepted Mr. Farnham's kind invitation, and found very much to interest and instruct them in looking over the 400 acres devoted to vegetable and fruit crops.

A month later the Society was invited to meet with C. I. Allen, of Terryville, among the beautiful Litchfield county hills, where he has made such a pronounced success of fruit culture.

A fall meeting and exhibition of fruits was held October 13, at Wallingford, in connection with a meeting of the New Haven county Pomona Grange. To the surprise of even the most sanguine this first attempt of the Society along this line was a decided success. There were in all 125 entries of fruits, and premiums to the amount of \$108.50 were awarded. In the opinion of experts and authorities there were more perfect specimens of apples shown at this meeting than at all the combined fairs held in the state during 1898. This exhibition was a great credit to the Society, and resulted in stimulating among fruit-growers a new interest and a desire to produce fruit of finer quality.

There have been sent out from this office, during the year, nearly 2,000 programmes, notices and circulars, besides hundreds of personal letters, all having been done at an expense of \$29.75. This indicates to some extent the

growth of our work and the wider influence that the Society is enjoying from year to year.

There is still need of more active work in increasing our membership list, especially in those portions of the state where the Society is least known. Our County Vice-Presidents, co-operating with the Committee on Membership, can do more to bring our membership up to the 400 mark than scores of letters from the Secretary's office. We may congratulate ourselves that already we have among our members many of the brightest fruit growers of the state, but let us all resolve to do a little personal work and carry the influence of our organization still farther.

In every instance our summer field meetings, with their social as well as their practical features, have been very successful; and they are among the most profitable gatherings we hold. Let me suggest that we have more of them in the future, and also that we continue the institute meetings, co-operating with the Granges of the state in every way possible to extend pomological information to our farmers.

While this Society is an excellent example of the principle of co-operation, yet we have done nothing in applying co-operation to buying supplies, or to selling our fruit-products. It seems to me that this matter should receive our careful attention now, and some practicable plan be devised and put in operation the coming season, if possible.

Respectfully submitted,

H. C. C. MILES, *Secretary.*

REPORT OF COMMITTEE ON BUSINESS AND LEGISLATION

In the matter of business among our members your Committee has little to report. Through our association with the Grange, most of our members are securing fertilizers and chemicals of Lucian Sanderson, of New Haven, at satisfactory rates. If a majority of our members would co-operate in only cash purchases of baskets and other fruit-packages, considerable money could be saved by distributing from full car-lots at the leading centers. Something

of this kind is already being done at some centers by a few of our members.

In matters of legislation your Committee has prepared and caused to be presented to the present General Assembly, a bill, making an appropriation of \$500 per year to our Society for the further extension of its good work. With a little help from officers and members of the Society it is believed that this bill will become a law, and that the Society will be able, in future, to print its proceedings and further extend its educational work in institutes and field meetings.

Respectfully submitted,

J. C. EDDY, *Chairman.*

REPORT OF COMMITTEE ON INSECTS

The Pear Psylla

One of the prominent features of the season which we are called upon to record is the prevalence of the pear psylla, *Psylla pyricola*, Först., which was unusually abundant throughout the state. It was first noticed at the experiment station about July 1, and had then caused some injury to the pear trees.

The pear psylla is a jumping plant-louse about one-tenth of an inch in length. It injures the trees by sucking sap from the tender twigs. A sweet, sticky substance, known as "honeydew," is exuded by the insect and soon covers the foliage, if the species is abundant. A black fungus grows in the honeydew. The leaves turn red or yellow and fall prematurely.

This psylla is somewhat hard to control, and an insecticide which kills by contact, like whale-oil soap or kerosene emulsion, must be used against it. The best time to apply it is just after the leaves of the pear tree expand in the spring. Honeydew is not then abundant and a thorough application will destroy many of the insects. Later applications should be made just after heavy rains, as the honeydew is then washed off and the insecticide is much more likely to come in contact with the insects.

Scale on Grape

A portion of a scale-infested grape-vine was sent to the Station from Bristol, in June. Scale insects are less common on grape-vines in Connecticut than on fruit trees, but this vine was seriously infested with a large hemispherical brown scale, belonging to the genus *Lecanium*. The scale proved to be *L. armeniacum*, Craw., a species commonly found upon rosaceous fruit trees in the western states, and which has spread rather rapidly in the east during the past few years. The several species comprising the genus *Lecanium* are not provided with armor, and are called soft scales. They are extremely susceptible to "contact insecticides" and can, therefore, be easily controlled.

Kerosene and the San José Scale

Last season the San José scale was reported from Burnside, Nichols, Cheshire, Rowayton and Ivoryton. New centers of infection have also been discovered in New Haven, Hartford and Bridgeport. Up to this time it has been found in twenty towns of the state, and some of these contain several infested localities.

The scale spreads less rapidly at the north than many believed it would, but it is still a much dreaded pest, and orchardists and fruit growers should always be on the lookout lest it be introduced into their domains.

Spraying trees with clear kerosene has been given a trial in Connecticut. March 1, several seriously infested Japan plum trees in New Haven were sprayed with kerosene. Sixty days afterwards no living scales could be found.*

"The kerosene was purchased in the market for illuminating purposes, and was supposed to be of good quality. It was applied by means of a 'Success' bucket-pump, through a Vermorel nozzle, and the spraying was done on a bright day, with plenty of air stirring, so that evaporation would be rapid. Where the kerosene was applied with care, little or no injury resulted. One tree, literally covered with scales from top to bottom, was drenched with kero-

* Connecticut Experimental Station Report for 1898, p. 272.

sene; nearly all the branches were killed back about half-way to the trunk.

"Uninfested trees of apple, pear, peach, plum, cherry and quince were sprayed with kerosene February 28. For several weeks no injury was apparent. Later, it was observed that some of the fruit buds and small twigs had been killed.

"Spraying with clear kerosene is hardly a safe treatment for the average grower to employ. If his trees are infested, he had better apply kerosene and water, which will do less injury and will kill the scale. At the Cornell station, excellent results were obtained by using a mixture containing 20 per cent of kerosene. For this work a special pump is necessary."

Pumps for applying kerosene and water are manufactured by the Deming Company, of Salem, Ohio, and by the Goulds Manufacturing Company, of Seneca Falls, N. Y.

A Borer in Plum Trees

In June, a section of the trunk of a Japan plum tree was received from M. N. Wooding, of Hamden. The piece of wood contained numerous tunnels or galleries, the openings of which appeared as circular holes through the bark. The borers made no effort to emerge from their galleries, but continued to excavate and enlarge them. Upon splitting open the tree-trunk, numerous small dark-colored beetles were found in the burrows. The larvæ and pupæ were also present. Specimens were sent to the Department of Agriculture, at Washington, where the species was identified as *Xyleborus pyri*, Peck. It is now considered identical with the European species, *X. dispar*, Fabr. The beetle is closely allied to, though distinct from, the "fruit bark beetle," now so frequent in Connecticut orchards. The two can readily be distinguished, because the "fruit bark beetle" burrows between the wood and the bark, while *X. dispar* makes tunnels wholly inside the wood.

Both sexes were found in the burrows. The female is about one-eighth of an inch in length and one-sixteenth in breadth. The male is somewhat smaller, being three

thirty-seconds of an inch long, but about as broad as the female. The male is thinner than the female, and the extremities taper less abruptly. Both are dark brown.

The tunnels or burrows reached nearly to the center of the trunk, and were cylindrical, branching sparsely. A fungus grew inside the tunnels, and the beetles are said to feed upon it.

This insect is sometimes called the "pear-blight beetle," but it should be understood that it has no connection with the fungous or bacterial diseases of the pear, which we know as blight.

Various kinds of fruit trees and the tulip tree, *Liriodendron*, are occasionally attacked by this beetle. It is doubtful if a satisfactory remedy can be found. Possibly a coating of white-wash or Bordeaux mixture, to which a little Paris green has been added, may prevent injury; but it will be useless to apply the coating after the beetle has worked into the tree.

In submitting this report the Insect Committee wishes to call attention to the importance of reporting all seemingly new insect depredations.

If the members will take the trouble to do this at once, the committee will not only suggest remedial treatment, but much loss may be prevented in case of an outbreak of species not hitherto regarded as sufficiently injurious to warrant the use of measures against its attacks. The committee is always ready to investigate sudden outbreaks, and bulletins can be issued if considered advisable.

All of which is respectfully submitted.

W. E. BRITTON,
Chairman.

REPORTS AND TRANSACTION OF BUSINESS

In the afternoon of the second day, the committee appointed on nominations for officers for the ensuing year submitted their reports.

Officers for 1899

<i>President</i>	J. H. HALE, South Glastonbury
<i>Vice-President</i>	J. H. MERRIMAN, New Britain
<i>Secretary</i>	H. C. C. MILES, Milford
<i>Treasurer</i>	R. A. MOORE, Kensington

County Vice-Presidents

Hartford County	W. H. MANSFIELD, West Hartford
New Haven County	DENNIS FENN, Milford
Fairfield County	S. B. WAKEMAN, Saugatuck
Litchfield County	C. I. ALLEN, Pequabuck
Tolland County	GEORGE WEBSTER, Rockville
Windham County	LUCIEN BASS, Windham
New London County	L. P. SMITH, Lebanon
Middlesex County	G. S. BUTLER, Cromwell

On motion, it was voted to accept the report of the committee and instruct the Secretary to cast a ballot for the list, as named by the committee.

Mr. Hale declined to serve as President for another year, but after consultation, the following resolution, presented by Mr. Fenn, was adopted:

Resolved, That from and after 1899 no President of the Connecticut Pomological Society shall hold office for a period of more than two years in succession.

In a response to a general desire, President Hale now consented to serve for one more year, much to the gratification of all present. The above list of officers was then declared elected.

The following resolution was offered by John B. Smith, and after some discussion, was passed by the Society:

WHEREAS, A more definite and accurate knowledge of the conditions for profitable apple orcharding in Connecticut is greatly to be desired; and

WHEREAS, A knowledge of the best results that have been secured and the methods that have won them is so essential to progress; therefore

Resolved, That the President of this Society appoint and announce at this annual meeting a committee, of which the present Secretary of the State Board of Agriculture shall be chairman. The duties of said committee shall be to devise and put in operation a system of pre-

miums for the most complete orchard records and best results that have, so far, been secured in our state, or that shall be secured during the term of service of this committee, with the design of giving to the apple orchardists of Connecticut new and valuable data as to cultivation, fertilization, pruning, spraying, varieties, and any other points that said committee shall deem it wise to consider. The committee shall hold office for five years, be empowered to fill vacancies among themselves, and to raise funds by subscription, or by arrangement with some first-class fertilizer manufacturer, or in whatever other way the Committee may deem most advantageous to the interests of the Society. But, in any event, the treasury of the Connecticut Pomological Society shall be put to no expense and shall incur no pecuniary responsibility for any of the transactions of the Committee, unless by direct vote of the Society. Said Committee shall make a report of its progress and plans at each annual meeting, and its premiums shall then be awarded.

The President appointed, in accordance with the above resolution, the following committee: T. S. Gold, West Cornwall; J. B. Smith, Berlin; A. G. Gulley, Storrs; Dennis Fenn, Milford; Edwin Hoyt, New Canaan.

On motion of Professor Britton, it was voted: That the Executive Committee of the Society be authorized to prepare and publish the proceedings of this annual meeting and such other matter of value and interest to Connecticut fruit growers as they think advisable.

President Hale announced the receipt of a telegram of greeting from T. S. Gold, the venerable Secretary of the Board of Agriculture, who was detained at home by illness.

On motion of Mr. Sternberg, it was voted: That a message be returned to Mr. Gold, thanking him for his interest in the Society, expressing our sympathy for him, and an earnest desire for his speedy restoration to good health.

In the course of the meeting the following papers and addresses were enjoyed, in the order indicated by the programme, and, at convenient intervals, topics from the Question List were discussed.

HOW CAN NEW ENGLAND APPLE-GROWERS COMPETE WITH OTHER SECTIONS?

By EDWIN HOYT

FARMING in Connecticut has reached a critical period. The farmers are inquiring what they can do to get a living from their farms. Western competition in grain, beef, pork, butter and hay has not only weakened our home markets, but has also depreciated the value and almost destroyed the sale of many of our farms. The outlook for Connecticut farmers who continue to cultivate their farms as in the past is truly a dark one; and farmers may well ask, "What can we do with our land to make it both profitable and salable?"

There must be some radical changes made in our system of farming, and that soon, or conditions will grow still worse as the years pass. The impoverished condition of our soil causes so much expense for manure or fertilizers to grow a crop that only those crops should be grown which yield larger profits for the growing.

Now the question is, "What crop can we raise that will give larger profits for the outlay than those we raise now?" My answer is, "Fruit, but more especially apples." It is conceded by the best judges of fruit that New England apples, well grown, are superior to those grown in any other section of the country. This is true not only of the apple, but also of the peach. But can apples and other fruit be grown in Connecticut at a profit? They can be; and, in my opinion, this is about the only crop we can cultivate with a good profit.

We must not delay too long in merely thinking about the matter. The West has already had a taste of the large profits realized from orcharding, and its fruit-growers are setting out whole counties in apple trees. In *The American Fruit-Grower* for January 7, 1899, my eyes caught the following: "State Senator H. M. Dunlap, of Springfield, is circulating a handsome little pamphlet on the Illinois

fruit exhibit at the Trans-Mississippi and International Exposition at Omaha, in which Illinois is represented as the home of the big red apple, with 400,000 acres in apple orchards, and 20,000,000 apple trees." Missouri, Arkansas, and Kansas are setting out more apple trees than Illinois. Ohio, Michigan, Pennsylvania, Virginia and Tennessee are all in the business of orcharding. Millions of trees are yearly being planted in these states, and unless the farmers of New England wake up, and that soon, the western fruit-growers will wrest from us the only crop we can raise to compete with them at a profit.

All the facts go to show that orcharding in Connecticut may be made to pay. That an acre of orchard may be made to pay, on an average, from \$150 to \$300 a year, after the trees are six years old, facts go to prove. How an orchard should be treated to give an annual profit of from \$150 to \$300 is a subject for another paper. You will all admit that we do grow apples, even here in Connecticut, without care; and with care we do not know how fine we can grow them, or what profits may be realized from so growing them.

If, then, we can grow superior apples here, the question is, "How can we grow them so as to meet and destroy the western and southern competition which is sure to pour in upon us, as with other farm crops?" My answer is, "By co-operation, or combination, on business principles; and, for successful orcharding, it must be *the* business of the farmers." The strong competition in almost every business is causing combinations or trusts to be formed, so as to lessen the cost of production, supply the goods cheaper to the consumer, and yet give a larger profit to the producer of the goods.

To reach the most profitable results, orcharding must be followed in the same way. Co-operation, or combination, is the only way to lessen the cost of producing the apples, and at the same time of increasing the profits. The advantages of co-operation are as follows:

First: A few skilled or expert men, such as farmers singly could not afford to hire, could be employed for the company. In this, a saving for expert labor would be

made, and more successful results obtained than from ordinary labor.

Second: From 25 to 30 per cent could be saved on the cost of fertilizers, and their quality could be improved. The chemicals could be bought and their mixing done by the company, thus making a better fertilizer than we now buy, at a saving of 25 to 30 per cent on the cost.

Third: The implements for cultivation could be bought at wholesale by one of the interested parties, thus saving no small amount.

Fourth: The trees could be bought for the company at cheaper rates.

Fifth: The spraying could be done with power machines and by experienced men, thus making it practicable to perform it at much less expense, and more successfully.

Sixth: Barrels could be bought to better advantage. If necessary, a cooper could be hired to set up the barrels from staves made where timber is cheap; or, if in shipping fancy apples boxes were preferred, they could thus be made more cheaply and more uniformly.

Seventh: A cold storage building could be built, with comparatively little cost pro rata, near a railroad station. Here apples could be stored, kept from decaying, quickly shipped when required, and sold at better prices.

Eighth: An agent could be sent to New York, Boston, or to Europe, to make sales for the apples, providing shippers would not pay satisfactory prices.

Ninth: A drying or evaporating plant could be erected, at small cost to each farmer, where from 500 to 1,000 bushels per day of "wind-fall" or inferior apples (if there were any) could be dried, thus deriving some profit from what is now largely wasted. The cores and parings could be made into apple jelly or apple butter, which would find a ready market at good profit. To show you the extent to which this evaporating business is carried on in some sections, I will quote again from *The American Fruit-Grower* of January 3: "The Lakeville, New York, evaporating works are closed for the season. Besides building the

evaporator, which required several weeks, the company has evaporated 50,000 bushels of apples. They have already sold \$8,000 worth of evaporated fruit, and still have twenty tons on hand. It is expected that they will evaporate 100,000 bushels next year."

Tenth: By co-operation more ready sales can be made, and at better prices, with less cost and anxiety to the grower than in our present "go-as-you-please" way.

I have named only a few of the advantages to be gained by this co-operative system, but I have said enough, I trust, to set some of you, at least, to thinking about it.

How can this work be started? Through our granges. Every grange in this state could arrange a co-operative organization, and start in this work of co-operative orchard-ing. The sooner the work is started and successfully worked up, the better it will be for us. The plans for working,—rules, regulations, etc.,—for operating the combination would have to be arranged by a committee and subscribed to by all in the company.

"But," says one, "You will raise more apples than the world can use." If we do, let the west suffer from the over-production. We, in the east, have suffered, and are now suffering, from western competition in everything we grow; but there is no danger of all the apples we can grow not selling. If they are of good quality and nicely put up, the markets of Europe will take them all. The demand for our apples will increase faster than we can grow them. Our own country is also growing, and home consumption will continually increase. By co-operation we can grow the apples and hold the markets of the east, as well as many of those of Europe.

Again, with co-operation we can also grow peaches and small fruits in connection with our apple orchards. Our drying or evaporating plants can use this surplus also, so that it can be sold at a good profit. Once started on this co-operative line, many other fruits or vegetables would be profitably grown in connection with the cultivation of orchards.

Think of it, brother farmers! Talk it over in your Grange meetings; if it appears to you practicable and

profitable, organize and make a start. It would be best to start right, and plant no faster than the trees could well be cared for. Perfect, handsome and attractive fruit, invitingly put up for markets, should be the motto of each grower.

Mr. Hoyt's excellent paper was then discussed by the Society.

J. H. Merriman spoke of the value of co-operative effort in the packing of apples for market. He believed that it would result in more uniform grading of the fruit, in better prices, and in a larger demand for apples bearing such a brand.

A. C. Sternberg favored co-operation in the selling of our fruit products.

PRESIDENT HALE: Far better results can be obtained by combining orchards under one managing head. This may seem a hard problem to work out, but there is a wonderful opportunity in this direction, and it can be accomplished successfully. Another way is to combine the capital. This is entirely feasible in the business of fruit culture. There is in Connecticut an abundance of cheap land suitable for growing apples. This can be had for from \$5 to \$10 per acre. Such investments are sure to prove satisfactory in the hands of men who believe in the work. We already have in the state several instances of this form of co-operation as applied to peach orcharding. Why not extend it in other directions?

ORCHARDING ON THE HILL FARMS OF NEW ENGLAND

By JOHN W. CLARK, North Hadley, Mass.

WHAT to do with the hill farms of New England, is a question worthy the consideration of every one of her loyal sons, to see if, in some way, a part of these farms cannot again be cultivated with profit.

I say a part of these hill farms, for every one must admit that no small per cent of our New England hills cannot, under the present condition of things, be cultivated, except it be at a loss, on account of the rugged nature of the surface, barrenness of the soil, distance from market and lines of transportation.

Leaving this class of land out of our consideration, we still have, in every one of the New England states, thousands of acres, the surface of which is comparatively level and free from stones, of easy cultivation, naturally strong and fertile, capable of growing any crop suited to our climate, and within a reasonable distance of market or shipping point, which, I am thoroughly convinced from experience and observation, can be made to pay a profitable return on the investment.

This may be done in other ways than by the growing of fruit, but as I have been asked to speak on orcharding for our hill farms, I will confine my remarks to the growing of fruit.

The first thing to be considered before investing money in planting our hills to orchards is: Can we, here in New England, grow fruits suited to our climate that will stand cartage and shipment and compete in the markets with the same fruits grown and shipped from other sections?

It was only a few years ago that our markets were supplied with nearly all their fruits by the surrounding country, little being received from outside the state; but, with increased railroad facilities and cheaper rates of transportation, today we must compete with grapes, peaches, pears

and plums from California, peaches from Georgia, grapes from Ohio, apples and grapes from New York, and apples from Michigan, Missouri and Nova Scotia, to say nothing of the immense quantities of oranges shipped from California and Florida.

Although we cannot grow the orange in New England, it probably affects the price of apples more than all of the other tropical and semi-tropical fruits combined.

The most important fruit grown in the temperate zone is the apple. Notwithstanding what has been said about the barrenness of our soil and the severity of the climate, the apple can be grown to as high a state of perfection, as regards color, flavor and keeping qualities, in New England, as anywhere else in the world; and it is an undisputed fact that New England's best apples are not produced in her meadows or valleys, but on her hillsides.

Admitting, then, that apples can be grown on our hills, the next question to be considered is: Can apples be grown and sold with profit at the market price, taking one year with another? Much is being said about the low price at which farm produce sells, and has sold for the past few years, and that prices are not what they used to be. This does not apply to apples, for, taking the price at which they have sold one year with another, it has not varied to any considerable extent during the last 20 years, the ruling price in the fall being about \$1.50 per barrel for No. 1 fruit.

The cost of picking and barreling apples varies with the style of the tree (high- or low-headed), quantity on the tree, and the size of the fruit.

In my own case, to pick the fruit from the trees has cost from 10 cents to 12½ cents per barrel, varying with the amount of fruit on the trees; to sort, face and pack the fruit in the barrel ready for heading, 5 cents; heading 5 cents; drawing three miles to car at 5 cents per barrel, 20 cents. Calling the picking 12½ cents, this makes the cost of picking the fruit and putting it on board the car, including barrel, 45 cents, which, with the price of apples at \$1.50 per barrel, leaves \$1.05 per barrel for use of the land and the growing of the fruit.

With trees planted 40 feet apart each way, we have 27 trees to the acre; reckoning the yield at 1½ barrels to the tree gives 40½ barrels to the acre, which, at \$1.05 per barrel, gives \$42.52. Deducting \$2 for plowing, \$3 for cultivating four times, \$2.25 for fertilizers and sowing, \$1.50 for pruning, makes the cost of cultivation and fertilization \$8.75 per acre, which, taken from \$42.52, leaves \$33.77 above cost of growing and getting the crop of one acre to the cars, which is 10 per cent on an investment of \$337.70.

I will state here that I have used in my orchard a fertilizer made of high-grade sulphate of potash and South Carolina rock-phosphate, mixed at the rate of one pound of potash to two pounds of phosphate, which makes a fertilizer costing about \$25 per ton. I use from 4 to 6 pounds of this to a tree. This may seem a small amount to apply to an acre of land; but when we remember that a barrel of apples contains less than 5 ounces of potash and less than one ounce of phosphoric acid, it is plain that, with an annual dressing of the quantity given, the soil is not growing poorer. I consider a fair annual dressing better than a larger quantity applied at longer intervals. Without taking the time to calculate the cost of growing an acre of orchard to bearing age, I will leave it to your good judgment whether an acre of orchard can be grown to bearing age for \$337.70.

S. D. Willard, in his talk at the winter meeting of the Massachusetts State Board of Agriculture, held at Amherst, Mass., last December, said that good apple orchards in New York state were valued at from \$200 to \$1,000 per acre, and that desirable orchards were not for sale.

Some may say that the cost of producing the crop has been placed too low. I would answer that the price of the fruit and the yield has been put correspondingly low, in proof of which I will add that a part of my orchard, set 20 years ago and covering some 13 acres, produced in 1896 1,300 barrels of apples; in 1897 it produced 300 barrels, and in 1898 500 barrels,—an average of 700 barrels a year or 54 barrels to the acre, and an average given when

we take two "off" years and one good year. Just here let me remind you that an apple orchard in New England does not get to full bearing until it has been planted 25 or 30 years. At this age, with proper care, it should continue producing profitable crops for the next 40 or 50 years, in many cases much longer.

In making my estimate of the cost of growing the fruit, you have probably noticed that two very important items have been left out,—the cost of spraying and of thinning the fruit. Both were omitted for the reason that very few apple orchards in Massachusetts are either sprayed or have the fruit thinned. I suspect it is about the same here in Connecticut, and I was afraid to include these two items for fear my figures would be disputed by those who have never practiced one or both of these operations. If I had given their cost I should have been obliged to give also the increase in price at which fruit sells when sprayed and thinned over that of fruit grown in the usual way, and the difference is so great that some might doubt my word.

The cost of spraying is not so great as those who have never practiced it may think. As near as I can estimate, it has cost me from 2 to 3 cents per tree for each spraying, or from 6 to 9 cents for the season, spraying three times. Thinning a crop of 1,300 barrels in '96 cost 5 cents per barrel, which makes the cost of thinning and spraying a barrel of apples 6 to 9 cents for the season. In any good market the selling price of fruit that has been properly thinned and sprayed is from 50 cents to \$1 per barrel more than that of fruit grown in the usual way.

Spraying increases the yield and makes the quality of fruit better by reducing the per cent of wormy and imperfect fruit. Thinning removes the wormy and imperfect fruit, and increases the size of what is left to such an extent that I doubt if the yield is at all lessened, while the color and quality of the fruit is much improved.

The chief hindrance to any great increase in the planting of apple orchards is the belief that they do not pay, which comes from seeing the neglected apple trees found on a large proportion of the farms of this and other states.

These orchards, in most cases, have not paid and can never be made to pay, for the reason that they are too far gone, or are made up of too many unprofitable varieties.

Admitting that apples can be grown on our hills at a profit when given proper care, the first thing to be considered is the soil and location. The soil should be naturally strong and fertile, capable of holding moisture, but not wet; the underlying rock should not be too near the surface, for, if it is, in seasons of severe drought the whole depth of soil becomes dry, the trees lose their leaves, and the crop of fruit is injured.

The surface should be sufficiently smooth and free from stone to admit of easy cultivation. Loose stones do not check the trees' growth, but they make cultivation more difficult and expensive. I would not advise any one to set an orchard where the ground cannot be cultivated, on account of the slow growth the trees will make, and the longer time it will take to get them to bearing.

In selecting varieties of apples to plant in a commercial orchard do not be guided merely by your own personal likings; remember that such varieties as the markets call for must be selected. Do not set too many varieties: dealers do not like to handle a lot of apples made up of several varieties. What they want is a lot composed of from one to three kinds of the standard market sorts. Select varieties that are known to do well in your vicinity, not the standard sorts of some other portion of the country; and, unless you have a near and sure market that calls for early and fall fruit, set only winter varieties.

Fit the land as for other crops before setting the trees. Do not plant the trees too close. If the soil is strong and the variety planted a good grower, 40 or even 50 feet apart each way, will be none too great a distance when the trees come to full bearing. In planting my own orchard the trees were set 24 feet apart each way. After 18 years' growth the trees in the best portion of the orchard began to meet, so that every other tree had to be removed or all the trees would have been injured. If every other tree is sure to be dug out as soon as the branches begin to touch, it may be advisable to plant apples 24 feet apart; but unless one has

the nerve to do this as soon as needed it is better not to set them nearer than 40 feet apart.

Cultivation should be given from the time the trees are planted till the time of bearing, when it may be advisable to sow clover, or some similar crop to enrich the soil; but an orchard (in my opinion) should not be *kept* in sod, neither should the clover or similar crops be removed, but should be grazed by calves or sheep, or mown and left to decay under the trees.

Prune the trees, when young, to the proper shape and, as they grow, see to it that this shape is kept.

Spraying the trees and thinning the fruit must both be practiced if good fruit and healthy trees are to be grown.

As to gathering the fruit, do not let it get overripe, and do not pick it green. If picked green it will never color nicely and the quality will be inferior; if picked too ripe the fruit will not keep well. If, during picking, the fruit is put in heaps on the ground under the trees it should not be left there more than a day or two, at the longest, for contact with the ground will ruin its keeping qualities. While the fruit is in heaps under the trees, keep it covered from the sun. The sooner apples are placed where the temperature can be kept from 32° to 35°, after being picked, the better will they keep.

Thus far in this paper I have spoken only of the apple, as it is our most important fruit, and the one on which we must place our chief hope of again making our hill farms profitable through the growing of fruits; but land that will grow good apples will, with proper care and feeding, grow any other fruit suited to our climate. Each must decide for himself, according to nearness to market, what he will grow, for with proper care and push any of our standard fruits can be made to pay a fair return on the cost of cultivation. Success depends on the man.

A noted strawberry grower, when asked what he fertilized his strawberries with, replied, "Peas," and that he could not grow them without peas. He said that he used three kinds, "push, pluck and perseverance," and that unless a man had these he never could succeed in growing strawberries. This applies with equal force in growing all

of our fruits, and shows why one man makes a success where another makes a failure.

When setting apple trees, it has been my practice to plant peach trees between them, which, in my case, has proved profitable, the cost of cultivation being only a little more than when apples alone are planted.

Some may fear that if fruit is extensively planted here in New England, our markets will be overstocked, and that prices will drop to a point below the cost of production. I, for one, do not fear this for choice fruit, well grown and properly handled. It is the poor and improperly handled fruit that will not pay.

As an example of how good fruit may be injured by improper handling, let me give you an experiment that I made when at the Missouri Experiment Station. I had six barrels of Ben Davis apples carefully picked and divided into two lots of three barrels each. One lot was sorted, making two barrels of No. 1 fruit and one barrel of No. 2 fruit; the other three barrels were not sorted beyond the throwing out of worthless apples. The two lots were marked so that they could be known. I then went to a dealer and asked him to put me up three barrels of Ben Davis and deliver them at the depot, barreled and ready for shipping. I saw these apples before they were put up; when picked from the trees they were as good as the other two lots. The three lots were sent to a commission house in St. Louis, with the request that each of the three lots should be examined and sold on its merits. The first lot returned me \$6.30, or \$2.10 per barrel; the second lot \$5.40, or \$1.80 per barrel; the third lot \$4.20, or \$1.40 per barrel. Thus I received 30 cents per barrel for simply sorting the fruit as it should be, and 70 cents more per barrel for fruit properly handled, sorted and packed, than I did for fruit equally as good when picked, but bruised and dirty from improper handling.

We have here the reason why one man can sell his fruit at a profit, while another is compelled to sell at a loss.

If, in giving you this paper, I have shown that upon our hills fruit can be grown at a profit when properly handled, and there are any here who enjoy caring for trees and

fruits who have not decided what line of business they will follow, I would say to them: Do not despise and turn your backs upon the hills of New England, for there still lies beneath their surface, for those who are not afraid to pay the price of success, a competence far greater than has been or will be attained by the majority of those who seek their fortunes in the city. A young orchard well cared for increases in value each year: to plant one is the same as placing so much money at interest. Stick to our New England hills, and care well for the orchard while it and you are young, and when you have grown old it will care for you.

At the close of Mr. Clark's paper some one asked when thinning should be done.

MR. CLARK: Thin the fruit as early as it begins to show size. It is better to thin twice during the season. This will result in giving very fine fruit, of superior color and good shape and size. This work of thinning looks, at first, like a big job, but it is not. We cannot afford *not* to thin, is the way I look at it.

Mr. Clark further said that he sets his apple trees 24 feet apart, and when they begin to crowd he cuts out every other tree on alternate rows. Later on, he cuts out again in the same way. The trees are then at proper distances for a permanent orchard. In pruning he would aim to make a strong tree with healthy foliage, for the leaves are the digestive organs of the plant. In Massachusetts orchards come into bearing in 10 to 12 years after planting. By thinning the fruit properly it is possible to make apples bear every season. The Baldwin, especially, is inclined to overbear, and its fruit should always be thinned.

In spraying, Mr. Clark uses 5 pounds copper to 50 gallons of water, and then puts in enough lime to make the mixture safe. He always tests the mixture when putting in the lime, and often puts in Paris green at the same time. Mr. Clark stated that his apples, grown according to the rules given in his paper, have brought highest prices in the Boston market.

ESSENTIALS TO SUCCESS IN GENERAL FRUIT CULTURE

By ROLAND MORRILL, Pres. Mich. Horticultural Society

THE conditions in Connecticut are very different from those in Michigan. New England is a rugged place in which to gain a living from the soil. The value of the land is nothing as compared with the *value* of the *man*. It all depends upon the *man* in fruit growing.

[Here the speaker referred to a certain man in New York state who sold from four acres of apple orchards over \$3,000 worth of fruit last season, while his neighbors picked almost nothing from their trees. "It was all in the man."—Ed.]

Conditions are changed in these days and are constantly changing. We cannot do as our forefathers did. Farmers are stubborn "critters," and are not progressive enough.

The fruit grower must learn from those who have succeeded in the business. Don't start out thinking you "know it all," but be willing to learn from others, without prejudice.

The apple is the commercial fruit. The best quality of apples is produced in the northern limit of their successful production. Where is the northern limit? In general, we may say it is from Lake Michigan to the Atlantic, including New York state and New England.

We have neglected our apple trees and the business has gone to other sections. We have the best apple markets at our hand, but have allowed them to be controlled by the growers in Missouri with their Ben Davis fruit, which, poor as it is, pays them well. Shall we let it go at this? We should seize new ideas and make it our business to produce fruit of the first quality, to suit the demands of a fastidious trade.

We must select, to begin with, the right location and soil. As to the best varieties, it is a hard matter to rule on, conditions vary so much. Cultivation is of the utmost

importance. Some tell us this is a non-essential, but the men who make the most money in fruit growing cultivate the most.

In order to combat injurious insects and diseases a man must be a student of chemistry, botany and entomology. The experiment stations tell us what to do; we must be able to apply these suggestions intelligently.

Many growers fail in marketing—an all-important part of the work. A man must be a good salesman, as well as a good grower. Many growers abuse the commission man. This is all wrong. We do not give him credit for what he has to do. The commission man is often fully as honest as the grower. You must use good judgment in your marketing.

Above all, feed and care for your orchards in the right way and they will care for you. Be teachable, do well what you have to do, and remember that Connecticut's opportunities in fruit culture are great.

In summing up the important essentials to success, Mr. Morrill named: First, the man; second, location and soil; third, proper varieties, depending upon the climate; fourth, intensive cultivation and thorough spraying; fifth, wise marketing.

In the discussion which followed his address Mr. Morrill said that most men want to grow more than one crop in an orchard. He would not advise planting peaches and apples in an orchard. He wants his trees to receive no check from the starting of growth in the early spring to the ripening of the wood in the fall; therefore, more than one kind of fruit on the same land is not desirable. Spraying he thought more a preventive measure than a curative of disease.

*SAN JOSÉ SCALE (*Aspidiotus perniciosus*)*

By PROF. H. A. BALLOU

IT is not the purpose of this brief paper to offer any results of original work on this subject, but rather to bring to your notice a few facts gleaned from various sources, both regarding the insect and some of the remedies for controlling it, especially kerosene.

In this work I have consulted the available literature, most of which came from the Department of Agriculture, Washington, D. C., and the agricultural experiment stations, and included, among others, the following authors: Dr. L. O. Howard and C. L. Marlatt, Washington, D. C.; Prof. W. E. Britton and Dr. W. C. Sturgis, of the Connecticut Experiment Station, New Haven; W. G. Johnson, of Maryland; A. H. Kirkland, Mass., and W. B. Alwood, of Virginia.

The San José scale was for some time supposed to have been introduced into the United States from Chile, but now it is believed that it was transported from the United States to Chile instead; and, indeed, in the light of all evidence we are not justified in assuming that any other country was more probably the original home of this insect than North America.

It was first noticed in the San José valley of California, about 1870, but was not definitely named till 1880, when Professor Comstock described it and gave it the name of *perniciosus*, or pernicious scale.

For several years the Department of Agriculture at Washington conducted experiments on remedial measures to be used against this insect; and then it was supposed that it was confined by climatic conditions to the Pacific coast. In '93, it made its appearance in Virginia, and this was the first intimation that the east was to be visited by this pest. Before the end of August, '94, it was known to exist in Florida, Maryland, Pennsylvania, New York; and, during '95, in Massachusetts, Connecticut, Delaware, Alabama and Louisiana. Nearly every case of infection in the east can be traced, more or less directly, to one or the other of two prominent New Jersey nurseries.

In the attempt to get a thoroughly curculio-proof plum, these nurseries, in '84-'87, introduced from California the Kelsey, an improved Japanese variety which they obtained from the San José district. Beyond all doubt these trees were infected, for it is recorded that they never did well, and probably all died. This, however, was sufficient for the infesting of the nursery and of the east.

Its first appearance in Connecticut is described in bulletin 121 of the Connecticut Station, New Haven, published July, '95, by Dr. Sturgis and Professor Britton.

Appearance.—On account of its minute size and inconspicuous colors the San José scale is not easily distinguished, and might easily pass unnoticed till the tree itself gave evidence that something was wrong, and then it is generally too late to save the plant.

In general, the appearance may be said to be that of a grayish, slightly roughened, scurfy deposit. The individuals appear rather circular or pear-shaped, with a central blackish nipple, and are of a dirty brown or grayish color. Trees thickly infested lose their characteristic color and appear as if coated with ashes. If this coating be scraped or crushed, the mass will show a yellowish liquid if the insects are alive. When the tree is not badly infested the insects occur singly or in small groups on the twigs, or at the base of the leaves.

The insect may be seen under the scale, by first lifting the scale with the point of a knife, as a yellowish, jelly-like mass. When found on the fruit the individuals are surrounded by a purplish ring, which is also, in some cases, seen on very young twigs.

Of all the scale insects found in Connecticut, this is the only one having a distinctly circular outline.

Professor Britton gives the size of the mature scale as about one-eighth of an inch in diameter. This is rather larger than any I have seen, yet it is near enough for practical purposes.

Life History.—The insect passes the winter in a nearly mature stage, protected by the scale. Early in the spring the winged males appear and a few weeks later (middle of May) the females begin to give birth to living young.

Each female may continue this from 34 to 40 days, bringing forth in that time, on an average, 400 young. At the age of 33 to 40 days from birth, the females of this brood are developed and the young of the next generation begin to appear. This makes such a complication in the matter of young that summer treatment is rendered difficult.

After a few hours (12-36) of active crawling about, the young insect settles down, inserts its beak, and begins to secrete its scale. This is the only active period of life, except in case of the males, which, when mature, are small two-winged flies. From this time the insect is a fixture, the scale being at first a thin white covering, turning yellowish and, later, gray.

The number of generations or broods has been difficult to determine, but it has been pretty well proven that there are four each year in the latitude of Washington, D. C.

Food Plants.—The scale is very general in its feeding habits. I quote from Professor Britton: "The San José scale has thus far been found in Connecticut upon the peach, apple, pear, plum and currant, but information from other states shows that it may attack most of our large and small fruits, and the rose, hawthorn, elm, basswood, alder, sumac, English walnut and various evergreens."

Spread.—The natural spread, unaided, can be but little each year, but the wind, birds and insects are believed to aid somewhat in this. The spread depends principally, of course, on the distribution of infested nursery stock.

Remedies.—Whale-oil soap solution (two pounds to one gallon) is highly recommended for winter treatment, and, though very successful in California, is not considered in the east to be exterminative. Rosin washes, kerosene emulsion and lye or potash washes have all been experimented with, but can be recommended only with certain reservations in each case. Hydrocyanic gas requires an expensive outfit, and, though very thorough in the west, is reported as not being entirely satisfactory in Virginia. Kerosene is one of the newer remedies, and is applied either pure or in mechanical mixture with water. Many apparently conflicting results have been obtained in experiments with this material. Mr. Alwood, of Virginia, reports very satisfac-

tory results from two seasons of work with this remedy: satisfactory both from the destruction of the scale and the lack of harm to the plants. When the work was done under his personal supervision and under proper weather conditions no harm resulted; when done in unfavorable weather for the purpose of experiment, plants have been more or less injured. Mr. Alwood is apparently very much in favor of spraying. Professor Smith, of New Jersey, also reports generally favorable results with kerosene.

Dr. Howard and Mr. Marlatt, of Washington, D. C., and Mr. Johnson, of Maryland, either do not recommend kerosene spraying or do so with reservation. They believe that the chances are so great that every farmer or nurseryman ought to be warned of the danger he runs; then, if he chooses to take the chances, the responsibility is his.

To Summarize.—Kerosene spraying has given, in different localities, varying results, under apparently the same conditions. The killing effects are quite uniform as regards the scale, but the variation is in the effect on the plants sprayed. Bright, sunshiny days, with plenty of air stirring, seem to afford about the best weather conditions; very late fall and early winter is the best season, and a fine spray the best method of application. But even under these most favorable conditions, and when the work has been done by an expert, serious injury, and in some cases death, has resulted to the trees.

The Demming Company, of Salem, Ohio, manufactures spraying apparatus for this work, in the bucket outfit, the knapsack and the barrel sprayers. The principle involved is the mixing of kerosene in the pump. The pump is connected with both water and oil, and by regulating the flow of oil the per cent of the mixture can be controlled. At present it seems to me that the only recommendation that we are justified in making to our neighbors regarding kerosene spraying is this: Go slowly. Kerosene has a great value in this matter, but everyone must work out his own salvation, because results vary so greatly with climatic conditions, locality and the condition of the individual plants. It is certainly worthy of extended trial,—but *go slowly*.

THE PROBLEM OF OVER-PRODUCTION

IN treating this problem, A. C. Sternberg said that when a market does not give a profit we are inclined to say that there is over-production. We must raise crops at the lowest possible cost. Two hundred quarts of strawberries would glut the Hartford market 40 years ago, when they sold for 40 cents a quart; but last year one retail dealer sold 1,500 quarts, at 10 cents, in one day. The speaker further stated that much of the dissatisfaction with commission men arises from sending too large consignments, and that it would be much better for the grower and for the market to leave fruit on the plants than to sell it at unprofitable prices. He suggested the plan of establishing a selling agent in each community to study the markets and handle fruit. Such an agent should be paid a salary, and could advise growers when to send in their fruit. He should be honest and bear criticism. Cold storage facilities should be provided to hold fruit until gluts are over. It is better to realize a profit on 50 per cent of the crop than to sell 100 per cent at a loss.

LESSONS FROM OUR ANNUAL FRUIT EXHIBIT

PROF. A. G. GULLEY said that the fruit exhibit demonstrated that some good fruit was produced in Connecticut, but that there was still a difference of opinion as to what should constitute exhibition samples. Fruit that is good to sell is good for exhibition; it should be perfectly free from insects and fungi. Typical specimens should be selected and all varieties carefully named. This is the chief value of the exhibit to outsiders. Many local varieties of merit are brought to attention at such exhibitions. One day is too short a time for learning all that such a fruit exhibit can teach, and for properly judging the fruit. Arrangements should be made to hold the exhibition earlier in the season hereafter.

Taken altogether, the exhibit of '99 contained finer fruit than was shown at any of the many fairs in the state, and, best of all, it demonstrated what really perfect fruit was.

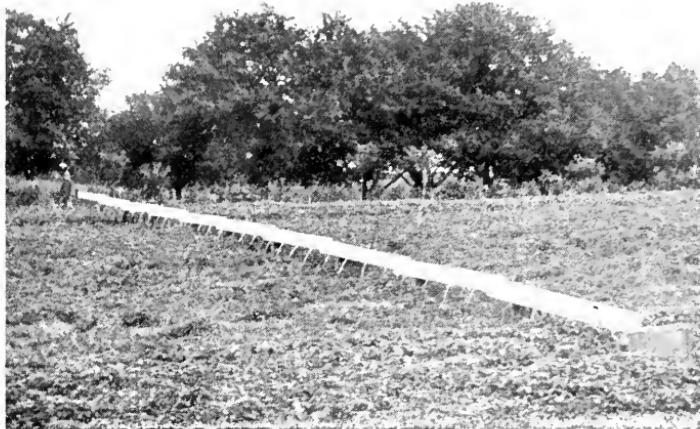


The little storage reservoir that checks a brook and heads it into useful irrigating channels.



Growing strawberry plants in the one-year peach orchard. By open-ditch irrigation water enough for both crops is supplied.

IRRIGATION ON THE HALE FARM.



IRRIGATION ON THE HALE FARM.

Troughs conducting water from main pipe line across strawberry fields; they can easily be transferred from one field or section to another, as required. Gates every three feet regulate the flow of water down each row.



70-YEAR-OLD PEACH TREE ON HALE FARM
AT GLASTONBURY.

This tree had much to do with the peach revival.



Feb. 15—Root and top pruned, ready to plant.
June 7—Same tree after two months' growth.

THE PRUNING AND CARE OF A PEACH ORCHARD

THIS highly interesting and practical address by Roland Morrill, of Benton Harbor, Mich., was illustrated by pictures thrown upon the screen, showing with great clearness the actual operations of pruning, etc., as practiced in Mr. Morrill's extensive orchards. Mr. Morrill first paid tribute to the magnificent trees of Connecticut, saying that the people of the state ought to be proud of their fine elms, and should realize their importance and value.

He further said that the aim of the peach grower is to obtain the largest possible bearing area in the shortest possible time. By intensive cultivation it is possible to grow as large a tree in three or four years as is usually obtained in five or six: it is also a better tree if grown rapidly at the right season. The growth should take place in the early summer months, and the wood should be ripened carefully in autumn.

Mr. Morrill believes in planting the largest and most robust trees he can get, and sets them 20 feet apart each way. Each tree should have a certain feeding area, as well as an area to hold moisture, and closely planted trees do not have this. He prunes peach trees during the latter part of March, when the wood is dormant.

The first season after setting the trees his practice is to grow some crop between. Would not recommend potatoes, as they take from the soil too much moisture that is needed by the trees. A late-maturing crop like melons is safer.

Mr. Morrill firmly believes in thorough thinning of the fruit. Would go so far as to say that the peaches should not be allowed to stand nearer than 8 inches. This work of thinning is done before the pit begins to form.

The pictures showing the fine, thrifty trees in Mr. Morrill's orchards, and the enormous crops of fruit they have borne, were a matter of surprise and delight to all present.

A spirited discussion and many questions followed the address.

The main points in his wonderful success with peaches Mr. Morrill thought were: *Constant* cultivation—as many as 35 or 40 times in the growing season; severe and thorough pruning; careful thinning of the fruit; well-balanced fertilizing and a proper ripening of the buds, so that they frequently stand 20 degrees below zero. [Season of 1899, Mr. Morrill reports 400 7-year Elberta peach trees that yielded 2,800 bushels of extra fruit, that sold for \$6,400.—ED.]

THE INFLUENCE OF RAINFALL UPON FUNGI

By PROF. BYRON D. HALSTED, New Jersey Experiment Station

WEATHER is a subject of universal interest. If one talks about his neighbors his gossip may lead many into trouble, but all can converse upon the weather and no one is harmed. One's opinion of the weather may be held ever so staunchly and his judgment upon other subjects of church or state remains without compromise.

But what is weather—this subject of daily and almost hourly comment? It is not so easy to define in a few words. By that term is understood the heat, the moisture, the winds and the cloudiness of the atmosphere. We live at the bottom of a great ocean of air, and are influenced greatly by the changes that take place therein.

It is our present purpose to glance only at that element of the weather generally known as rainfall. Rainfall is measured in inches upon the whole exposed surface. This amount varies greatly with the locality and the seasons. It is greatest in the regions of the equator. As a rule the rainfall decreases as the distance from the sea increases. It increases to altitudes of 4,000 feet, and then decreases.

In the United States the largest precipitation is in Florida (50-75 inches) and in the far northwest. On our western coast there is a winter maximum of rain and a dry summer. The Mississippi valley has a summer maximum, and our eastern coast a late summer maximum,

although our rains are quite evenly distributed through the year.

In New Jersey, and I think Connecticut is not so far away but that it has much the same conditions, we have this tabulation of the rainfall, month by month, during the last ten years. In making up this chart for the state of New Jersey, we have taken the growing season only. This is made up from figures obtained from the state weather service, which has been in operation a good many years and has about fifty observers scattered all through the state.

The rainfall during the six months of the growing season is shown in the following table:

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	Avg'e
April....	5.32	2.65	2.19	2.49	5.21	3.09	4.88	1.35	3.79	3.74	3.47
May	4.09	4.24	2.97	5.04	4.07	7.72	2.85	3.21	5.68	7.00	4.69
June	3.73	3.59	2.92	3.85	2.95	2.28	3.24	5.46	3.38	2.10	3.35
July.....	10.19	5.62	5.30	4.03	2.72	1.66	4.26	5.50	11.42	4.96	5.57
August..	5.18	4.90	5.32	3.63	6.52	2.58	2.53	1.83	4.39	5.36	4.22
Septem'r	8.36	4.75	2.46	1.81	3.20	7.46	1.07	4.37	1.65	2.00	3.71
Total .	36.87	25.75	21.16	20.85	24.67	24.79	18.83	21.72	30.31	25.16	25.01

There is a wide range in the amount of rainfall during the six months of the growing season for the last ten years, it varying from 36.87 inches in 1889 to 18.83, or only half as much, in 1895. The table shows that 1897 was next to 1889 in precipitation, while the other seven years are not wide from the average.

In 1889, in August, we had a remarkable outbreak of potato rot, and the growers would say to us: "Come see and look and learn something. Here we have ruin and you had better see it."

In some of the counties it was ruin. In some places the potatoes were not dug at all, and in others, where they were left in furrows to see how they would behave, the heaps became intolerable. In July, 1897, we had 11.42 inches rain, which was a warning to the farmers to get their potatoes out of the ground as quickly as possible. A great many did so, and put them in a cool, dry place. So there was a practical benefit in the information, which, in 1897, came in time and was taught from the fatal results in 1889.

In this year the grape crop also suffered greatly. My records in the annual reports show that for the autumn of 1889, in the best grape-growing regions in our state, not a single full cluster of grapes was picked. The same trouble came in 1897; it was not as bad as in 1889, and I think the difference lay in the fact that the rainfall of 1897 was during July and August, with a let-up in September, while in 1889 it kept up tremendously for three months. We found that 1890 was about an average year in regard to rainfall, yet the records show that it was a bad year in the sense that there was a great deal of decay in potatoes, in grapes, and in other crops. I speak of this to bring out the point: that during the wet season of 1889 there was an accumulation of the germs of the disease, a great "glut" in the market of spores, so that in an average year, following a year particularly favorable to the development of the disease, there is still a great amount of this disease.

In 1891 we had a dry year, and yet there was still some disease in the various vineyards, orchards and truck farms, but much less; they had outgrown it to a certain extent. You cannot judge what a year will bring by knowing exactly what the rainfall is for that year; you must know something of the history of the weather for the years before it.

The rainfall for May, 1894, was 7.42 inches; for May, 1898, it was 7 inches. The rain came early; now what is the history of the fungus side of this matter? In 1894 the fire blight broke out in New Jersey as never before, so far as the records go. There was fire-blight on pears, quinces and apples. Up to this time, in that state, the Kieffer pear was considered ironclad against blight. In the same year the Smith Cider apple went out, and the growers of that apple said, "We have had enough of it."

Now, why should we expect any considerable amount of blight in the orchard when we have heavy rains in May? It is the time when everything is unfolded, everything most tender. The germ can get in and fasten itself most readily in the unfolding leaf-buds and foliage.

Knowing, as we do, the nature of the disease, bacteria

or blight of the pear, quince and apple, we can attribute it to the large amount of moisture. During this year we had spread over our state something I never saw before. Every tree, in almost every orchard, was all blighted; there were apple trees with every flower blighted. On the Smith Cider apple even the little twigs were blighted. On the pear trees blight started at the tips and spread quite to the ground. Now, 1895 was our driest year, and, if we were going by the book, that year should have been free from blight; but 1894 entailed upon 1895 a crop of spores which it took years to outgrow and overcome. So does one season lap over and influence another.

We had a dry year following, but it rained just at the right time to hit the orchardists in the eye with the fire blight. In 1896 we had not very much moisture, and there was really less blight until 1898, when it came again. This year, just closing, we had a large amount of rain in May (7 inches), and we had the blight coming again. The early part of 1898, last spring, was a wet one, and it was hard work to get things done. The rain and wet everywhere developed the apple rust to an alarming extent; in New Jersey the hillsides became almost an orange color.

In 1894, we had apple rust, and more still in 1889, but last spring was a rusting season with us; rust and smut were rampant for the early portion of the season. [From here on the speaker was interrupted with questions.—ED.]

You must cut and burn for the fire blight in pears and quinces; but the apple will take care of itself. Excessive pruning will be more harmful in the pear than in other fruits.

I think you can get a suggestion from our worthy friend from Michigan in connection with his work in the peach orchard; I think you can feed up your plants to disadvantage with nitrogen, and encourage this fungous disease by too high feeding. Yet, high feeding is what they ought to have for maturing wood in autumn and for leaf-expansion in the growing season.

This last spring, with 7 inches of rain in May, we had the peach curl in New Jersey; we had it, also, in 1894,

with 7.72 inches rain in May. I do not think I would spray for the peach curl. I used to think we must spray for everything, but now believe that the peach curl will take care of itself, and that you can save your money. The peach is a "squint-eyed" thing, and you never know just how to take it; it is apt to turn up wrong somewhere if you go to fooling around it with the pump.

I have seen hundreds and thousands of trees that seemed to have every single leaf affected with the curl; yet in three weeks it was all gone, and the trees looked all right. New leaves came out, the peach curl leaves all dropped, and there had been no spraying. Peach-leaf curl is a little different from any other fungus, and it will take care of itself much better than most diseases.

Q. What is your method of spraying?

PROF. HALSTED: I would spray right in the face of adversity and try and hit him between the eyes. I would spray right in the season when the germs were growing, and every other season, for that matter. In case of a particularly wet season I would spray as many times as the Michigan peach grower cultivates his orchard.

Because it rained every other day, I would not wait until the clouds rolled by and then begin spraying. These conditions are all too favorable for the spread of the fungus. The moist condition of the leaves and the not too strong light, both tend to the development of this disease, and we should have the fungicide on the leaves then, of all times. Spray in the winter, spray before the buds open, then spray afterwards, and if it is a rainy season, spray all the more.

One of the best spraying machines I know of is the pruning shears. The pruning shears and a sharp knife are right up-to-date on fungous diseases. We must cultivate, prune, thin and spray.

There is a new mixture for spraying that I use, with but little lime in it, so that it does not clog the nozzle. You can do away with the lime by using another alkali. Start with a single pound can of lye: let that be the unit. This is better than potash, as it takes so long to dissolve the potash. Add to the lye a certain amount of sulphate

of copper, 3 pounds to 30 gallons of water. I have tested this mixture on 8 or 10 crops, and consider it just as good as Bordeaux. If you could use the potash, the genuine potash, instead of the soda, you could add potash to your soil as a fertilizer in a very limited way. This is a little more expensive than Bordeaux. It has the advantage of not coating your fruit, if you are spraying late in the season, with a layer of lime, which is objectionable. It is not a perfectly clear solution, but it is close to it and carries but little coloring matter.

MR. PLUMLEY: Have you watched the spread of the yellows in connection with the rainfall?

PROF. HALSTED: We had a good deal of peach yellows, instead of good peaches, in New Jersey last year. In Sussex county they have what some call "prematureing of the fruit," also what some call "forcing of the fruit." All of these three seem to be the same. It seems worse in rainy seasons, when trees are overloaded with fruit.

CONDITIONS THAT INFLUENCE THE SETTING OF FRUIT

By N. S. PLATT, State Pomologist

EVERY fruit grower understands that the embryo fruit of the opening blossom needs something added to it from the outside, independent of the sap it feeds on, to make it stay alive and grow. Not so well understood, however, are the qualities and workings of this outside factor, which in plants we call pollen. This dust, too fine usually to be noticed, but so necessary to continue the life of the fruit, nature provides under varying rules; sometimes in the same flower with the embryo fruit, sometimes on a different plant or tree. Sometimes, also, we find that while the pollen of a plant, or a variety of plants, is able to fertilize its own fruit, yet it is not so potent as is the pollen of some other allied plant.

This has proved itself true many times over, so that now no one thinks of planting one variety of strawberry alone

I think that about the same conclusion has been arrived at, or soon will be, in regard to pears and plums. The safest way is to plant different varieties near together, so that their pollen will intermingle.

In the case of varieties that have no pollen, or are impotent to fertilize themselves, it is plainly necessary either to drop these varieties,—and they are often the best we have—or to supply them with pollen by planting other potent varieties near them.

There are some varieties and some families of fruit that seem to have proved that they need no attention of this sort. Of these I would name the raspberries, the blackberries, the whole family of peaches and the Baldwin apple, all of which can be expected to be fruitful if planted singly with no other kinds near them.

But, you may say, we have varieties that produce pollen, and we have the varieties mixed in the orchard; why, then, are our orchards so often barren? Why are our strawberries frequently shriveled and knotty?

There are five cells in an apple, each of which should contain two seeds. Unless pollen falls on each of these five cells the apple is not perfect; it either grows lopsided or blasts. The part that is pollinized grows faster than the part that is not.

The strawberry has many more cells or seeds than the apple, and each needs a dusting of pollen. The pollen is a fine, delicate dust, and its virtue or power is apparently greatly diminished by cold. So when a frost just precedes the blossoming of the strawberry, as it did in the spring of 1898, it kills some of the embryo fruit outright, and prevents the complete pollination of the rest, so that it is small, one-sided, dry and knotty. We rarely have frosts when pears and apples are ready to bloom, but we frequently do have cold winds or cold rain, and from the days of our fathers and grandfathers until now, whenever these conditions prevailed for two or three days in blossoming time, it was expected, and usually proved true, that pollination was more or less imperfect, according to the severity of the weather.

The conditions of weather most desirable during pollina-

tion are warmth, sunshine and gentle winds. Such conditions favor the expanding of the delicate parts, the shedding of pollen into the air, and also the working of insects among the flowers. I suppose California has a model climate in these respects, which accounts for varieties of fruit which are unproductive on the Atlantic slope, being productive and reliable there.

But there are two causes which, I believe, with us, are responsible for more losses of tree fruits than are all other causes put together. These are fungus and weakness of bud and pollen. Professor Bailey, who has been studying this same question in connection with the apple orchards of western New York, says: "The immediate cause of most of our apple failures of the last few years is undoubtedly the apple scab fungus. This apple scab is no new pest. It has no doubt been seriously present ever since apples were grown in this country, causing many failures of crops which were laid to the weather or the moon. But within the last decade it seems to have been unusually destructive in the orchards of western New York. The most serious injury wrought by the fungus in western New York in recent years is upon the foliage. Its first visible attack upon the under side of the leaf is simply a light olive green discoloration appearing in small patches, chiefly along the veins, where the disease causes dark, sooty elevations. These attacks cut off the food supply of the parts of the leaf beyond, and the leaf becomes dry and curled. Its edges die and are torn by the wind, giving the tree the blighted appearance which is familiar to all New York apple growers. This condition of the foliage is often serious, even when the apples themselves are very slightly attacked; and it is sometimes so bad that most of the foliage falls in early summer. It is evident that trees with such foliage as this can neither mature a crop of apples, nor lay up much store of energy for the following year."

We have the apple scab in Connecticut, we have the dry curled leaves and the effects which follow. The tree with its foliage impaired, no matter what kind of a tree it is, cannot do justice to itself. If it is an apple tree, it cannot mature a crop of apples in good shape, or make

and mature a good crop of buds for the year to come. Consequently such a tree blossoms but little, and when there are blossoms, they often fail from sheer weakness.

Another cause of weakness is lack of sufficient food. I believe I am safe in saying that food alone will not overcome this bud weakness unless a healthy foliage goes with it. Further aid in strengthening the buds may be given by pruning useless branches and thinning useless fruit. The latter may be hard to practice, but the benefits are seen, not only in the existing crop, but also in the crops that come after. The pruning off of useless branches reduces the number of leaves and buds, thus tending to make those that are left stronger; it also admits light and air.

I believe I have spoken only incidentally of bees as transmitters of pollen. I have no doubt that they play a very important part in it. Several writers have claimed that during the last season of good bloom but unprecedented failure of apples to set, they saw good results from having hives of bees in the orchards.

Now, to summarize a little and to recall the conditions which are favorable to the setting of fruit, which are also partly or entirely under our control: First, plant different varieties near one another, that pollen may intermingle; second, feed the soil; third, obtain healthy foliage and bud; fourth, supply bees.

As regards the orchards of Connecticut today, with the exception of peaches and Japan plums, it seems to me that the problems we have most need to heed are the food and foliage problems.

The food problem is too much for me to talk about very intelligently, but I have a leaning toward the idea that we must not omit the potash. Dr. Jenkins is right at home on this question, and I expect this afternoon he will tell us what plant-food to use to get the strong, healthy bud.

The foliage, of course, has many enemies, and I cannot speak of them all. The apple scab, like all fungi, yields to the Bordeaux mixture. Two sprayings, or even one, will do a wonderful amount of good, and effects will be greater the second and third year than the first. Who

that has used Bordeaux on any foliage that was suited for it has not seen the added life and vigor of the leaf, the firm, hard wood and bud, and fruit that go with it? Appearance favors the use of it; reason favors it; results favor it.

Food and foliage are evidently what we need to make the apple productive, and it is within our power to supply these. Food and foliage are what we want to help the pear. We can supply the food, but it is not so easy to retain good foliage on account of the pear psylla and because the glossy foliage does not hold Bordeaux well.

Food and foliage again come uppermost when we talk of quinces and domestic plums: both need high feeding and Bordeaux. Peaches and Japan plums, so far, have perfect and enduring foliage. Long may they continue to have it! They need, however, to be well fed. May not the unusual productiveness of these two fruits be traced largely to their habit of carrying good foliage through the season?

Friends, take up this question and study it yourselves. How many of you can say that your apple and pear trees carry a full crop of foliage through to October? How many can claim even three-fourths of a crop at that time? When you come to look into the matter it may be worse than you think.

Suppose at the end of August you have trees that have only half, or less, of the season's foliage left on them. Will it take you long to figure out the probable result of such a state of things? Take the existing conditions into account and help where you can.

MR. MERRIMAN: If a tree promises to bear the next year does it throw off its foliage earlier than one that does not give this promise?

A. Could not tell you as to this.

Mr. Merriman stated that he had observed this to be the case in a number of orchards.

Q. Do you consider it necessary in planting Japan plums to mix the varieties, or will they take care of themselves?

A. Do not think it is safe to plant one variety by itself. I planted my Satsuma plums that way and they did all

right, but my other varieties are mixed. Thirty feet apart is far enough for the purposes of pollination, but I feel safer if the varieties are jumbled up together in a row.

Q. Is it not possible for a peach tree to carry too much foliage?

A. I do not know whether that has reference to wood or foliage. I do not believe a peach tree can carry too large and strong leaves, but I believe it can carry too many by having too much wood upon the trees. If I allow an excess of wood and foliage I get poor fruit.

MR. HALE: If you get any really elegant fruit it comes from the trees with the best foliage, not from those lacking it.

MR. FENN: Do you mean large, dense foliage?

A. I mean large, healthy leaves, well distributed over the trees.

Q. If trees are over-vigorous and have too dense foliage just before time of fruit maturity, what would you advise?

A. In case I found a tree in that condition I would allow the weeds and grass to grow; that would take away some of the nitrogen out of the soil, and thus might, in some measure, correct the greenness and sourness of the fruit. Another year, I think you could put on more potash and help out in that way.

In reply to a criticism in regard to the use of nitrogen on his peach orchard, Mr. Morrill replied: I did not intend to be understood as saying that nitrogen was necessary. I do not know what my soil contains, but it seems to have sufficient nitrogen without any effort on my part. You will have to find out what your own soil needs. A balanced ration shows that it must have a certain amount of nitrogen there to get perfect results. It is present in my soil, so I have not had to make any special effort in that direction.

The discussion, "What are the Apparent Results of the Repeal of the Peach Yellows Law?" was opened by J. Norris Barnes, of Yalesville.

RESULTS OF REPEAL OF THE YELLOWS LAW

By J. NORRIS BARNES

Mr. President and Brother Fruit Growers:

This body has already put itself on record as believing in the principle involved in the carrying out of the Connecticut yellows law. If, in this discussion, I should wander, or draw somewhat on my own experience, obtained in learning and managing my own business, I hope that I shall not exhaust your patience.

I wish to state, right here, that in the matter of peach yellows, of which in so many ways so little is known, I hold my opinion subject to change; for in the experience gained during the last twenty years I really feel that with no certainty can the cause of peach yellows be pointed out, and that the only remedy of any use is the severe and not entirely satisfactory one of promptly removing the tree.

The repealed law, in my opinion, was not in existence long enough to accomplish its purpose, even if it had been thoroughly enforced; and I believe it was next to impossible to thoroughly enforce such a law in many places. I should say from a quite close observation of the workings of the law, that the state can offer protection successfully to any community of fruit growers, from careless, indifferent or worse members of it, when the most of those members will actively support such a policy; in any event, it could wisely offer the instruction and knowledge of an expert in such matters, which, no doubt, could be obtained at a reasonable price.

I believe the active co-operation of the peach growers, great or small, as well as the acceptance of the principle involved in the repealed law, necessary in order to obtain great success in fighting the yellows. It is very important to begin right in any matter, and especially so in order to successfully combat yellows. We must plant stock free from pit or bud taint of yellows and spot the first cases of yellows that, from unknown causes, may show up in our young orchards. It seems to be very hard to wholly cor-

rect mistakes made along this line in the early life of an orchard or neighborhood practice.

I remember that along early in my peach-growing years, N. S. Platt and myself paid a visit to one of the pioneer commercial growers. I had yellows in my orchard and was alarmed at its ravages. He seemed to have plenty in his also, and seemingly did not fear it or contemplate fighting it. I decided to fight the trouble, pulling out by the roots a large per cent of trees. This old orchard of mine last season surrendered its last trees, planted in 1880 or 1881. As to the neighborhood visited, I have been told that a passive policy prevailed and that in successive plantings the trees seemed attacked at an earlier age, until finally many showed the disease before producing their first crop of fruit. I believe that a locality may become so seeded with this disease that it is folly to plant there until after an interval of the absence of all peach trees.

In our own orchards we have endeavored to apply the principle involved in the repealed law right along—before its enactment, while it existed and since its repeal. While taking out cases of yellows as thoroughly as we know how means, in some seasons, the loss of a good many trees, still we have found our yield of fruit increasing, in a full fruit-crop year, up to the present time, although we do not, on account of losses from several causes, expect that our old orchards will again, at present, produce as largely as they have done. Now do not misunderstand my statement: We have bad cases of yellows to remove every year, but the horse does not seem to have taken the bits in his mouth and run away with us.

A young hundred-acre orchard that we have may perhaps, like many others, be subject to adverse conditions that may follow from the repeal of the yellows law, on the non-application of the principle involved. Within half a mile of this orchard is the remains of an older one, the owners of which but partially complied with the law when in existence; at the last inspection neither the cards or trees were apparently removed. Within this same distance another small orchard exists, the owners of which are anxious to remove all cases of yellows, so far as they can find

them ; but, presumably, they may not be able to spot such trees until yellows shows very decidedly. Two years ago I found upward of 100 cases of yellows in this young orchard of ours ; last season there were a very few only, but some of these were as nice-looking and thrifty trees as could be found in the orchard. As we took great pains in getting our stock, and as cases of yellows were taken from about every different lot of stock, we felt hardly justified in charging them up to bad stock.

Really, if the peach yellows is contagious, as claimed by many, and as I believe, we who wish to grow peaches must protect ourselves in some way or else we must expect a thinning out of our orchards that will render them unprofitable. If any are wise enough to profit by such an experience, would it be too much to expect that later we may see the peach business largely in the management of a combine able to secure and control conditions essential to success ? I am rather inclined to take this view of the situation, as it now stands, and to feel that the repeal of the yellows law—instead of its revision, if it needed any—was a direct blow at the man who had a few acres on his farm on which, but for the yellows, he could successfully grow the peach. The man who has a considerable investment in peach orcharding, must, for his financial salvation, fight the yellows by destroying each diseased tree on the appearance of the very first sign of disease. General farmers, noting the success of our best peach cultivators, were tempted to plant a good many peaches, in a small way, without very much knowledge as to their culture. The repeal of the peach yellows law left these people to drift, with the mistaken opinion that yellows, after all, was not a contagious or dangerous disease. Little attention is being paid to it ; it is spreading more rapidly, and the loss to the state from the repeal of the law is apparently falling on the small commercial planters and the owners of few trees in family gardens.

FERTILIZERS IN FRUIT GROWING

By DR. E. H. JENKINS, Director of Connecticut Agricultural Experiment Station

WE FIND in the substance of fruit trees, as in that of all crops, considerable quantities of potash, lime, magnesia, sulphuric and phosphoric acids, and relatively small amounts of soda, iron and chlorine. We have no data as to the total quantities by weight of these things in the whole tree, and we know that the different parts of the tree contain very different amounts. Thus the young wood contains a larger per cent of potash and phosphoric acid in the dry substance than the old wood. Two years ago I saved all the trimmings from sixteen yearling peach trees, and determined several fertilizer ingredients in them. I found in the dry twigs:

	Pounds per acre (150 trees)
Nitrogen, 1.01 per cent	0.70
Phosphoric acid, .21 per cent	0.14
Potash, .47 per cent	0.33
Lime, .97 per cent	0.68

This, of course, represents only the growth which is cut off. We know that these things, although forming but a very small part of the whole tree, less than $\frac{1}{40}$ of the twigs, less than $\frac{1}{200}$ of the inner wood of the tree, are absolutely essential to the plant's life. However small the total quantity, a certain amount is indispensable.

There are four things—not three—which, generally speaking, the fruit grower has specially to look out for in his fertilizers: nitrogen, phosphoric acid, potash and lime. The first three we need not say another word about, but why name lime with them? Because, for one thing, our Connecticut soils, excepting in the western part, are not limestone soils, and are not rich in lime; although they may contain naturally more available lime than potash or phosphoric acid, yet it is quite likely that, unless care is taken, lime may become relatively deficient in fruit orchards.

Then, again, the growth of wood and of leaves of fruit trees makes much larger demands on the lime of the soil than

on either other fertilizer ingredient. Thus the ashes of deciduous trees contain three times as much lime as potash; those of conifers nearly six times as much. The disproportion between potash and lime is even greater in the case of leaves. On the other hand, most fruits contain more potash than lime. But the total annual growth of the tree, fruit included, takes, I believe, much more of lime in the aggregate than of potash.

Another reason for numbering lime with the fertilizers to be applied to orchards is this: If *any* ingredient of the soil is lost by leaching, it is sure to be lime, and more of lime is likely to be lost in this way than of potash or any other mineral matter. We are told often enough that soils absorb or fix plant-food, potash, ammonia and phosphoric acid, and hold them so that they will not, readily at least, leach out. We are not told, perhaps, often enough, that any fixing of these things is only possible by an *unfixing*, a releasing, of some other base—usually lime; so that, if the soil is leached by rains at any time of the year, putting on potash salts, to a certain extent, exhausts lime. Generally, perhaps, this loss is not a serious one, but on soils naturally poor in lime it may be serious, and trees may suffer for want of lime, while they have abundance of the more expensive ingredients—potash and phosphoric acid. Nitrogen, phosphoric acid, potash and lime, then, are the things which fruit growers must regard in fertilizing orchards. The other necessary elements of plant-food will be supplied incidentally in supplying these.

Some plants are naturally deep-rooted, some shallow, some have a strong tap-root, others throw out several strong roots from the same point without a tap-root. But while all this is true, it is likewise true that, in most cases, a tree or shrub cannot closely follow the architectural plan peculiar to it, but is forced by outside conditions to modify this plan. If the tap-root strikes a ledge, it must turn aside, and being in this way made less effective, the lateral roots grow the more to take its place. If roots strike a stiff clay, and find too little air, they slacken or stop their growth there, and grow the faster elsewhere. Hence, it is true, I think, of our orchards, that the shape and extent of the

mass of roots are determined by tillage, character of soil, water supply and food supply, a great deal more than by the "nature" of the trees themselves. Shallow rooting and deep rooting are, in fact, determined by the soil, and not by the character of the tree.

It is a common but very erroneous belief among many orchardists, that the spread of the roots of a tree is about the same as that of the tops. But all the observations thus far made go to show that, ordinarily, the roots far outspread the tops. Thus Bailey, in 1898, dug out two roots of a Howell standard pear tree, set in 1889, on a hard clay knoll. The full spread of the tree was 7 feet; but the roots ran 21 feet in one direction on their hunt for plant-food. If they ran as far on the other side, here is a spread of 42 feet, or six times the spread of the top. Even at their shallowest point, they were 8 inches below the surface, out of the reach of the plow, while at a distance of 21 feet they were only $2\frac{1}{2}$ feet down. In a rich, well-tilled soil, and set in the same year as the other, a Fall Orange apple spread its roots 8 feet on each side of the tree, while the branches spread but 4 feet on each side. Its roots, too, were below the reach of the plow. The soil about these trees had been well tilled. But another tree growing on sod land was found to have its roots close under the surface, where tillage would destroy them, where drought would kill them, and where they had to fight for their food with lusty grass roots.

These facts, with a multitude of other observations, show clearly that, by our orchard management, begun before the trees are set, and continued without any intermission, we can put the main mass of the roots where we want them, and keep them there; also that, under ordinary conditions, the whole soil of an orchard is full of roots, and that fertilizers sown broadcast will as certainly, probably more certainly, be quickly available to the trees than if spread only under each particular tree.

Another thing worth remembering is that the roots of any plant will search for food as well as for air and water. If you set a plant in a tub or pot of rather poor soil, the roots will spread pretty evenly through it. If you enrich the soil with some fertilizer well mixed all through it, the spread of

roots will be even, but perhaps not so extensive. If, on the other hand, you use the same amount of fertilizer in a third pot, but mix it with the 3 inches of soil next the bottom, you will find this layer filled with fine rootlets, which are the effective part of the root, while the root system is very sparsely spread elsewhere in the pot. If the fertilizer is mixed with the 3 inches of soil next the surface, or is put in a section of soil on one side the result is the same. Just so surely as a hungry cat follows the milk pan, the roots of any plant follow after the plant-food in the soil, and when they find it, the feeding roots go all through it, and stop hunting elsewhere.

The main roots of any perennial plant are, of course, fixed and immovable in the soil from year to year. Such roots have, for the most part, lost all power of taking up plant-food. They are woody and covered with a dead bark, somewhat like the trunk of the tree. The real work of imbibing food and drink is done by the slender rootlets and by the root hairs, and these are constantly making new growth. Besides this, at certain times, whole new roots start. Whenever clover, for instance, is cut, a sudden new growth of roots takes place before any growth appears above ground, and it is quite certain that, with each renewal of tree growth above ground, or before such growth, there is a new growth of fibrous roots below; that is, a fruit tree occupies new tracts of soil as well as pushes fresh roots into the old root pastures. These tender roots lay hold of particles of soil so strongly that they cannot be pulled apart, the acid plant-juice can gnaw the rock fragments so as to etch them where it has taken out plant-food, and all the gathered material is passed on through the young sapwood chiefly to the leaves, where it is used for building up the plant, also for laying by a reserve of food in the stem or root to be used for the early spring growth or for perfecting fruit. Experiments have shown that a fruit tree may lay up a reserve of food in its trunk and root, which may be carried there for more than one season, to supply, perhaps, the extra draft made on the tree in a great bearing year.

Next we come to inquire how much plant-food, of the sort supplied in fertilizers, a fruit tree or an acre of fruit

trees takes from the soil in a year, and how much of this is taken away from the land in fruit and leaves. This cannot be directly and fully answered, for the data are lacking. Let us see what we have. We have a single estimate of the quantity of plant-food removed in a crop of peaches as determined several years ago at our station. Reckoning 130 trees to the acre, and three baskets to the tree, as an average yield from orchards five years planted, we found that about 20 pounds of nitrogen, 22 of potash, four of phosphoric acid and only one of lime were taken from an acre of peach orchard in the fruit. By the way, the pulp of the peach contains, by far, the larger part of the nitrogen and mineral matters. The stones and seeds carry only one-fourth of the nitrogen and one-tenth of the ash elements.

The composition of apples, and very likely that of pears, is not very different from that of peaches, though pound for pound of fruit, apples take more mineral matter from the soil than peaches. The leaves, too, contain, while growing, large quantities of mineral matter, and carry off a part of this when they fall, not the whole of it, by any means. It is a well-established fact that, during the summer, the tree withdraws these things from the leaf into the stem. Thus it has been shown that the leaves of the peach contain the highest percentage of nitrogen, phosphoric acid and potash in May, and the percentage steadily decreases through the season. The largest total amount is found in July, and then decreases till the leaves fall. In some tests of oak and chestnut leaves years ago, I found that green oak leaves lost between one-third and one-half of the per cent of nitrogen in their dry matter between the time they began to fade and the time they were dead or falling—less than one month. That is, on October 16 the leaves contained 1.93 per cent of nitrogen, but November 13 they had only .77. The dry substance of the leaves in the same time lost two-thirds of the percentage of potash, and one-half the percentage of phosphoric acid, while the lime remained, and did not flow back into the tree trunk. For these reasons, I believe, estimates of the exhaustion of soil calculated from the analyses of leaves gathered *before they fall*, are likely to

be quite wide of the mark. A large part of the same mineral matter and nitrogen which are found in the leaves while they are still green, may be found the next year in the fruit crop. It is only the amount of plant-food found in the leaves after they have fallen which can be reckoned as a loss to the orchard.

In July Professor Roberts, of the Cornell Experiment Station, had all the green leaves picked from a Seek-no-further apple tree of fairly thrifty growth but under normal size, in an old apple orchard, and found that, calculated from his results with this tree, an acre of orchard at that season would contain over 8,000 pounds (four tons) of leaves, and that in them there would be 33 pounds of nitrogen, 13 of phosphoric acid, and 40 of potash—a larger amount, probably, than would be found in them either earlier or later in the season, and, probably, a good deal more than they would take from the tree when they fell in autumn.

But what has all this talk of root systems and tree trunks and leaves to do with fertilizers for fruits? Why, *everything* to do with it! It is the knowledge of the book farmer, which is applicable not simply to one orchard, one soil, one set of conditions, but to *all* orchards and all soils. Now let us see if from it all we can gather any practical suggestions which may serve to quiet those who "seek after a sign;" an agricultural recipe, definite and concise; no cure, no pay:

First: Broadcast fertilizers in orchards. It is better policy than to sow around each tree separately. Of course, if you want to try doctoring a sick tree, that is another thing—but a better thing is to pull out the tree and set another. But you cannot throw bone dust and potash salts into any part of a thrifty orchard where the tree roots will not get at it.

Second: If you cultivate, plow under the fertilizer deeply, right after sowing. It keeps the main roots down where they belong, and, if the fertilizer is turned in just above them, it will sink somewhat as it dissolves, another annual rootlet and root hairs will come up to get it, and, if they are cut by next year's plowing, there is no harm

done. Put your fertilizer where you want your roots, and you will get them there. You can call them as you can call a flock of hens. If you only top-dress, which is all you can do, unless you cultivate, the tree roots will come to the surface, where they will suffer from drought sometimes, and from competition with grass roots at all times.

Third: Don't forget lime in some form, as a necessary plant-food. If you are using wood ashes freely, as many of our orchardists are doing, your orchard gets all the lime it needs. Over one-third of ordinary Canada unleached ashes is carbonate of lime. But if you use muriate of potash instead of ashes, try putting on half a ton of lime to the acre every few years. It will settle the lime question, and will very likely make your fertilizer nitrogen more available.

Fourth: Don't be afraid to put on nitrogen, quickly-available nitrogen, and plenty of it. Don't give too much thought to the talk that nitrogen makes the tree run to wood and leaves. A peach crop takes off from the orchard nearly as much nitrogen as it does potash. We found 20 pounds of nitrogen in a peach crop, and 22 pounds of potash. We found twice as much nitrogen as potash in peach twigs and small branches. In the roots, limbs and trunks of the apple, Professor Roberts found as much nitrogen as potash, and in the green leaves, two-thirds as much nitrogen as potash. Your crop doesn't grow on air. It must grow on sound, lusty wood, and only there, and sound wood must have plenty of nitrogen for its growth. A well-balanced fertilizer will not make a tree "run" to this or that; a well-fed tree will do what it was meant to do from the beginning, and unless you starve it in one direction, you cannot *make* it run perversely in another. Nitrate of soda has been used on nursery stock, and also on peach orchards in bearing, with excellent effect. Cheaper forms of nitrogen may also be used, especially where the orchard is cultivated in early summer.

Fifth: Remember that cultivating is fertilizing. Dried blood, bone, cotton-seed meal, and all the organic forms of nitrogen are thrown away in a soil too wet or too dry, or not well supplied with air. They need to be tickled with

the cultivator, and to have the soil above them lightened to let in air, so that, by microbe action, their nitrogen may take the form of nitrate, and go to feed the trees.

Sixth: Does it pay to practice green manuring with rye or with crimson clover? Sometimes, and then again, sometimes not. Think first what green manuring does—that is book farming; and then think whether your land needs that thing done—that is practical farming. Either crop gets a start in midsummer or early fall. Now before clover or rye do much of anything above ground, they send out and down a very large root system below ground. While the crop *looks* as though it were standing still for several weeks, it is growing tremendously below ground, and reaching out and laying hold of all the available food that it can get. It takes very little moisture out of the surface soil in the fall of the year, but takes up available plant-food rapidly. If the crop is clover, and if the soil is not rich in available nitrogen,—and it is not likely to be,—considerable nitrogen may be taken out of the air and fixed by the clover for its use. When spring comes, assuming that the crop is not winter-killed, a rapid growth begins above ground. The green crop still draws some food from the soil, and as its foliage increases, pumps water also out of the soil at a pretty rapid rate. This goes on until the crop is turned under. Then decay begins, going on much more quickly in clover than in a grain crop, and gradually the plant-food of this green mass is turned over to the growing trees.

How soon the matter of a green crop becomes available to plants, after plowing under, we cannot tell. It is not, probably, very prompt in its action. By July, we believe our fruit trees have a larger amount of nitrogen and mineral plant-food in their leaves than in any other month. From then on, they are passing it back into this growing wood. Their greatest demand on the plant-food of the soil has been met for the year. It is generally believed, too, that a large supply of soluble plant-food in the soil, later in the season, may stimulate growth too much, and leave too little time for the wood to ripen and harden up before winter. This is a point where careful

experimenting is needed, but in the light of our present knowledge, it would seem that a green crop growing rapidly in late summer would serve to absorb the soluble plant-food of the soil, which might otherwise unduly stimulate growth of wood in the trees, and to hold this store of food till the trees needed it again. This I conceive to be one of the uses of a green crop in the fall. In the spring, I would not call it any great loss if the crop dies—as crimson clover is so likely to do after living all winter. The plant-food is there in its roots ready to be taken up by the trees. But if the crop is all there in the spring, how long shall we let it grow? Some do not plow till the middle of May, when the clover is in full bloom. I question whether, when turned under as late as that, the trees will get very much plant-food from it the same year. If the land is inclined to be dry, harm may be done by drying out the soil too much with this lush crop. If, on the other hand, the land is very moist, the green crop, by standing till full grown, may be a benefit, playing the part of a temporary underdrain.

Seventh: Is there any formula which may serve as a general guide in fertilizing orchards? I have none to recommend. In New Jersey, Professor Voorhees, who has had as good a chance for study and observation on this matter, says these proportions have been found very serviceable: One part, or 100 pounds each, of ground bone, acid phosphate and muriate of potash, or 150 pounds of ground bone to 100 pounds of muriate; i. e., four parts of nitrogen, 50 parts of potash, and from 22 to 36 of phosphoric acid. On soils of good character, for apples and pears, Professor Voorhees would use 400 pounds of either of the above mixtures, beginning when the trees reach the bearing period. As they grow older, and bear more, increase the dose. He says, however, that the best growers use from 1,000 to 1,500 pounds of this mixture annually, and find their profit not only in larger yields, but in quality of fruit and in increased tendency to continuous crops and longer life of the trees. On lighter, sandy soils, he would use even more of this "basic" formula, and with it at least 20 pounds of nitrogen in some form, equivalent to

125 pounds of nitrate of soda. For peaches, he recommends still heavier fertilization, because the cropping is more exhaustive and the tree matures more rapidly. Here, too, he would use some quickly available nitrogen like nitrate of soda.

The only careful and continuous experiment on the fertilization of a peach orchard, of which we have full record, was made by Professor Voorhees. The fertilized plot received annually 150 pounds nitrate of soda, 350 pounds dissolved boneblack, and 150 pounds muriate of potash per acre. The manured plot had 20 tons of manure each year per acre, and another plot received no manure.

In seven crop years, the yield without manure averaged 86 baskets per acre annually; with fertilizers, 262; with manure, 277.

In a very favorable season, the plot without fertilizer or manure yielded only 11 baskets; fertilized, 152; manured, 162.

He found that, on unmanured and unfertilized land, the crops, after eight years, were so small as to reduce the average of the whole period; while on the manured or fertilized land the average was not only not reduced, but actually increased; i. e., after the unfertilized trees had practically ceased to bear, the fertilized trees were bearing better than ever. It is also noteworthy that fertilizers tided the trees over unfavorable seasons, making them moderately fruitful, while the crop of unfertilized trees was a failure.

Q. Do these amounts of fertilizer given represent the quantity of food used in a crop of peaches in a single season, or does some of the food pass back into the tree?

A. I think you cannot judge entirely by what you find in the fruit itself.

MR. PLATT: I understood that the nutriment that was in the leaves went back into the buds and remained for another year. Now, the relative amount of nourishment that is stored up in a tree depends on the amount of leaves you have grown, and the size of the leaves, so that a tree which had only one-third or one-half of the leaves full size,

and the rest smaller, would not be likely to have a full setting of buds.

MR. KIRKHAM: It was stated here that an argument in favor of thinning apples was that picking off the surplus saved the ripening of the seeds, as the maturing of these seeds took from the vitality of the tree.

DR. JENKINS: It is not only to save the ripening of the apple seed, but also to work the salvation of the apples; it is not altogether a question of apple seed, but also of the whole apple. You, of course, can expect larger apples when the tree has only half as much work to do.

Q. In a peach orchard that is now of fairly thrifty growth, would you advise the application of nitrogen up to the time it comes into bearing?

A. Professor Voorhees, of New Jersey, considers that a formula containing a moderate amount of nitrogen, and heavy in phosphoric acid and potash, gives best results, and should be applied from the outset.

Q. How about leaves on trees where the leaves are very thick and sunlight not able to strike in? Might not a tree have fewer leaves and not less nutriment?

A. That is very hard to tell, because you cannot prove it one way or the other. Of course leaves that are shaded by other leaves cannot do as good work as if they had the full sunlight. Whether the tree would do better with some leaves gone or not it is impossible to say. Possibly those leaves do some work without the full sunlight.

WHAT CAN SMALL FRUIT GROWERS DO TO IMPROVE MARKET CONDITIONS?

By J. C. EDDY

THAT conditions last season were very discouraging to small fruit growers, especially to growers of strawberries in Connecticut, is a fact well known to all who had anything to do with marketing. To overcome these conditions, in a measure, is a necessity, if we are to continue in the business and receive any profit or even fair returns for the skill and labor required.

There were several causes for the very low prices that prevailed last season; some of these have been in operation for several seasons, tending more and more to lower prices. One of the most important of these has been the large and increasing shipments of berries from the south. The growers there, judging from the good condition in which their fruit reaches our markets, have almost reached perfection in fruit handling and shipping. A great quantity of berries from North and South Carolina were sent to the Hartford markets, last year, in refrigerator crates. These are strong crates, holding 64 to 80 quarts of berries each. They have a galvanized iron pan containing ice, over the berries, and as, at that season of the year, the berries come from a warm climate into a cooler one, they reach our markets in almost perfect condition, looking nearly as well as our home-grown berries do when brought only a few miles in hot, moist weather.

These shipments begin to come from Florida in February, and are followed up from points further north week after week, until our native berries ripen; consequently, not only is the profitable sharp edge taken off prices for our first pickings, but, after three or four months of strawberries, people are beginning to tire of them, so that the fruit has to be very attractive and cheap to tempt them into buying. I have no doubt that many of the southern growers have shipped at a loss, or, at least, have had to take lower net prices than we have, but that does not make us resigned to our lot.

Another important factor in making low prices is the large increase in the last few years of small growers all over the state. These growers, with from one-fourth of an acre up, having been able to dispose of the surplus from a small patch to their neighbors or to the local store at a fair price, have increased their plantings without making adequate plans to dispose of the fruit; consequently, in a favorable season they found themselves with a surplus of berries and no reasonable prospect of selling them. These people, who had never handled more than one or two crates per day in the height of the season, were loaded with from 10 to 20 crates; consequently, berries were sold as low as 50 cents per crate of 32 quarts, for a few days.

In my own case, there was one day when there seemed to be absolutely no market for the berries, and picking was stopped for twenty-four hours. An outlet was found the next day, however, and, as the weather was favorable, the berries were all picked and sold at a price that just about gave a new dollar for an old one.

To what extent will these conditions confront us the coming season and in the future? In my opinion the era of high prices, or large profits per acre, has gone by. We will probably see a repetition of the low prices of last year for a few days this year, but the matter of over-production will either be regulated by smaller planting, or else we will be doing a lot of work for fun. It does not seem to me that our sense of humor is educated up to getting much enjoyment out of low prices.

What can we do to improve these conditions? We must stop increasing the acreage, or cut down the amount we are already carrying. Will we do it? Probably not. If we get the idea that the other fellow is going to do all the cutting down, and we can pitch in and plant more than ever, we will be sadly left. In all seriousness, I believe we must do something of the kind if we are to get fair profits from our business. If every one of us would cut down our acreage one-fourth or one-fifth, the effect would be felt in our markets; we would have more net profit, and the consumer would have to pay but a trifle more.

I wish we could have a stronger and closer organization of the fruit growers, with members in every town in the state willing to report to the Secretary, each year, the number of acres in bearing condition, the number newly planted, and all conditions relating to the several fruit crops of the state. With such an organization and such reports, we would be in a condition to make our plans on a firm foundation.

I fear we will have to wait some time before carrying out such a plan, although there is nothing impossible about it. All that is necessary is for a public-spirited fruit grower in each town to volunteer to report to the Secretary for his own town. Let us consider this matter and see if we can bring some practical results from it. The shipment of fruit from the south, California, and other fruit sections, we must meet by having all fruits we offer better than theirs and as near perfection as possible, both in appearance and quality. There are two classes of fruit growers that figure in our markets; perhaps once in fifty times one grower figures in both classes successfully.

There is the grower who sacrifices everything to quantity and cheapness of production and fills a large place in all markets. Then there is another who is aiming at fancy trade, and gets it by growing fancy fruit. Perhaps nine out of ten of us try to shoot both ways, but, as we are not crack shots, we hit neither mark. We miss cheapness of production by not being up to date in our ideas of cultivation, fertilizing, etc. We miss fancy prices by not having fancy varieties and fancy ideas of marketing.

As to best methods of marketing, this is a question hard to solve satisfactorily. I sometimes think that if it were possible to have all berries—we will say all in the Hartford, New Haven and Bridgeport markets—sold at wholesale, either by auction or otherwise, and by one firm, as is done at Worcester, Mass., it might be an advantage to the growers. But there are many difficulties in this plan, and perhaps it could not be made a success unless all growers in this vicinity, as well as all retailers, were agreed. Certainly some plan that would prevent ruinous competition, to the extent of selling below the cost of

production, as was done last year in many cases, would be gladly welcomed by the bulk of the growers in this vicinity.

MR. BUTLER: Mr. Eddy speaks of the southern peaches and berries brought into our market. There is no question that the berries brought from the south this year, after our native berries were gone, did sell at a loss, many selling at not over 2 cents per quart. As Mr. Eddy says, it is the small-fruit growers with a small acreage, from one-fourth of an acre up, who are doing the mischief in our markets. They do not come to market every day and do not know the market conditions and prices. After going from store to store, continually lowering the prices, they finally sell out to some huckster because they are in a hurry to get home and see to their hay: and so the market becomes thoroughly demoralized from such agencies. Large growers, I think, could be held together very well if it were not for this competition of the irregular producer. We might gain some relief from the competition of the southern grower, if we could make some arrangement either for uniform markets, for having one central market, or for commission men to handle all our berries. I think this latter would be the most feasible plan, but the great and lasting difficulty is to get the growers to put all their berries into the hands of the commission men. No doubt Mr. Eddy would be willing to do it, and some of the rest of us, but there are others who make the mistake of thinking that if they sell their own berries they get all there is in it. I think we will have no difficulty in arranging with the local wholesalers here in Hartford, that if we will give them our berries, they will not handle any outside berries, or have others come in during our season. This would improve the market at once and save us all the labor of peddling our berries, all the chance of bad bills, and also make a really better cash return for our berries.

It would also benefit the small grower to come in with us on any such basis. I think all here would be willing to put their berries in the hands of one or the other of the leading commission men, if any such agreement could be made by those delivering berries in Hartford by teams. There might be one or two of the large retail stores that

would ship in some berries, but I think their desire to hold the best trade of the city would overcome their desire for cheap berries, and would force them to buy of the wholesalers here, to be sure of having best berries and regular supply.

MR. FARNHAM: There is one little point that possibly might be controlled, that, while it is not extensively practiced, still is a drawback upon the sale and price of a good many quarts of berries each season. I refer to the practice among some dealers and hucksters of buying berries, taking them from the full quart basket and putting them into "snide" or "skin" baskets, thereby making 36 or 42 baskets out of a bushel crate of standard baskets. You know a good many of our basket handlers catalogue what they call "standard," "snide" and "skin." The "snide" holds quite a little less than a standard quart, while the "skin" is just what its name implies. We find in some of our markets today that men whom you would least suspect of it have fallen into this deplorable habit; and while there are not many of them who use the smallest size, there are a great many who use what is known as the "snide."

The result is that men who sell the standard basket at an honest profit must compete with these dishonest dealers, who, by changing the basket, sell at the same price they paid, and still make money. If they can save five to eight quarts on a crate, they can afford to sell almost at cost, in comparison with the profit generally made. This might be controlled, I think; they do not sell as quarts of berries, but as baskets, and a law should be passed which would compel all berries to be sold in baskets of standard size.

PRESIDENT HALE: In Springfield and Worcester for some years a large number of the growers have been putting their berries in the hands of the commission men early each morning; each grower's lot has been placed by itself and numbered on catalogue. The dealers and hucksters have congregated in large numbers, and, after looking over the different lots and marking on the catalogue each his own ideas as to quality and price, they have entered the auction room and the lots have been quickly sold,

according to number. Where a single grower had more than five crates, his lot was broken up into five-crate parcels. This method has worked very successfully and caused every lot of fruit to sell fully on its merit at the highest price that any one of the dealers present thought it worth. For the last five years the average returns have been far better than the average returns of Hartford.

MR. ———: Last year through the "rush" days of the strawberry season, the Port Jefferson boat brought into Bridgeport 500 crates, many of which sold at one cent per quart. If I went in to the Bridgeport market with berries a huckster or some of the other merchants would say: "I can buy berries from the Port Jefferson boat at one cent per quart; if you want to sell your berries at that price, I will take them, or, if not, you may take them home."

MR. SHERWOOD: I have had a little experience in the Bridgeport market. True, a good many berries come from Long Island and sell at one and two cents per quart, and possibly this has a bad effect; but I think, as a general thing it does not hurt the native fruit as much as we imagine. If our fruit is good and properly packed and freshly put upon the market, the best customers prefer it every time. I find that I can get better average prices for my whole crop by turning it over to the commission men than by attempting to peddle it out to the retail dealers. The wholesalers know more of what is coming in from the outside, and are in better shape to quickly raise or lower prices than is the grower, who has not the same opportunity of keeping posted as to outside conditions.

THE QUESTION LIST

Q. Has crimson clover, or any other crop for green manuring, proved valuable in Connecticut?

N. S. Platt said that clover had succeeded in his peach orchards; also added a caution about overdoing this green manuring, as too much humus in orchard lands is not desirable.

PROFESSOR GULLEY: Crimson clover will winter all right in eastern Connecticut.

Mr. Fenn pointed out the fact that even if it is winter-killed its whole value is not lost; the gathered nitrogen is stored up in the roots of the plant.

Q. What are the best five varieties of peaches for Connecticut planting?

MR. MERRIMAN: Mountain Rose, Oldmixon, Stump, Late Crawford, and Elberta.

Q. What new varieties of peaches are likely to supplant the older kinds?

A. Champion is destined to take the place of other older sorts; although it cracks quite badly, it is better than Oldmixon.

Mr. Platt said this cracking was due to the wet season in a great measure.

Mr. Wakeman complained that this variety clings.

Mr. Platt said, in reply to this, that it is a habit of fruit on all young trees.

PRESIDENT HALE: Many standard sorts, like Mountain Rose, Oldmixon, and Stump, cling more or less in wet seasons.

Q. What new implements are to be recommended?

MR. IVES: The Diamond Cutaway harrow.

Mr. Barnes spoke for the Morgan hoe.

President Hale liked the California Cutaway harrow, made by the Cutaway Harrow Company, of Higganum, Connecticut.

Q. What is the best distance to plant an apple orchard?

Several said 40 feet apart.

MR. FENN: This is not enough; would prefer 50 feet.

Professor Gulley spoke of the plan of setting trees 20 feet apart, and in 15 or 20 years cutting out a portion.

President Hale endorsed Professor Gulley's plan, but said many planters had not the moral courage to cut out at the proper time.

Mr. Ives objected to this plan on account of its making an orchard too thick for best results in spraying.

President Hale said head low and cut back close.

Q. Is the Jonathan apple valuable to plant in Connecticut?

PROFESSOR GULLEY: It is a fine grower with us at the college. It has not fruited yet, but promises to be desirable.

Q. How can we prevent the brown scab, which mars the beauty and reduces the value of certain varieties of peaches?

DOCTOR HALSTED: Best plan is to thin the fruit thoroughly. The scab is more abundant when the tree is overloaded, but much depends upon the season.

Q. Is there any late variety of peach more satisfactory and profitable than the Fox Seedling?

MR. PLATT: No; this sort is being planted very largely. It is the best late white-fleshed peach we have.

Q. Can any one testify that the apple maggot has succumbed to spraying or natural enemies?

PROFESSOR BRITTON: No one can say this with certainty. The only way to be rid of it is to destroy all infested fruit. Spraying will not do much injury to this pest.

Q. Can the fungous diseases that attack the raspberry be controlled, and, if so, how?

PROFESSOR HALSTED: Can best be controlled by digging out the diseased plants. Some growers succeed with spraying for this trouble, while others do not.

Mr. Morrill answered that this disease will succumb to thorough spraying, but conditions are such that few growers can do it. The young growth needs to be

drenched thoroughly several times during the season, carrying the nozzle near the ground and throwing the spray up under the bushes. Sprayed in this way the fruit will not be injured by the Bordeaux.

Q. Is it safe to use Bordeaux mixture on the foliage of Japan plums?

MR. MORRILL: Yes; I spray my Burbanks successfully, but not with the usual strength of Bordeaux. I use the 4-6-50 mixture, using plenty of lime.

N. S. Platt expressed great surprise at Mr. Morrill's statement, as in Connecticut spraying of Japan plums while in leaf had always resulted in severe injury to the foliage.

President Hale endorsed Mr. Platt, and said it was not safe in Connecticut to use Bordeaux either on peach or plum in leaf.

Mr. Morrill replied that in Michigan he had used Bordeaux even on peaches without injuring the foliage.

Q. Is the English sparrow an enemy of the fruit grower?

Mr. Jeffrey thought that this bird helped to disseminate scale insects.

Q. What are the most profitable plums?

MR. JEWELL: Abundance, Burbank and Chabot.

Q. Does it pay to scrape and burn the scrapings from old trees?

A. Yes; and by all means burn the scrapings. This will destroy many insects and fungi.

Q. Is the practice of budding plums on peach stock wrong? Are they not liable to be infected with peach diseases?

MR. PLATT: I think not; but trees so budded require heavy feeding to succeed. Many well known plum growers prefer Japan plums on peach roots; among these are Messrs. Burbank, Willard and Morrill.

President Hale said he would rather have them on plum roots. He thinks trees are longer-lived when so grown, and less liable to have yellows.

MIDDLETOWN INSTITUTE (1899)

This meeting with Mattabesett Grange opened at 10 A. M., Thursday, March 16, 1899, with President Hale in the chair.

PROGRAMME

MORNING SESSION

Music.

Address of Welcome By the Mayor of Middletown
The Successful Cultivation of the Peach . . J. NORRIS BARNES, Yaleville
The Growing of Small Fruits for Home and Market . Pres. J. H. HALE
The Market End of Fruit-Growing (followed by discussion) . .

N. H. SHERWOOD

Recess for Dinner

AFTERNOON SESSION

Music.

Some Important Points in the Production of Choice Apples . . .
Prof. A. G. GULLEY, Storrs College
The Outlook for Profitable Orcharding in Connecticut . . .
Discussion opened by N. S. PLATT, Cheshire; J. H. MERRIMAN, New Britain; E. M. IVES, Meriden, and A. C. STERNBERG, West Hartford.

A Question Box, to receive any inquiries upon fruit topics, will be introduced as time permits.

The address of welcome, by Mayor Weeks, of Middletown, was responded to by President Hale.

The discussion on "The Outlook for Profitable Orcharding in Connecticut," was opened by A. C. Sternberg, of West Hartford, who said, in brief, that the one important thing in fruit culture was to have faith in the business and faith in ourselves. The signs of the times show that more fruit is being demanded by the people, which is encouraging to fruit growers. The experiment stations and agricultural colleges are a great help and encouragement to fruit-growers.

Connecticut peach growing had received a setback that winter, but the people were demanding peaches, and they would have them. The best peaches in the market every

year were the Connecticut-grown peaches, and Mr. Sternberg advised young farmers to go into this industry and raise the very best. The markets were never glutted with fruit of finest quality, and there were always openings for young men who would give fruit-growing their best efforts. Horticulture is keeping the young men on the farm, and they are the future hope of our state.

President Hale emphasized the point that we should feel that our state is *the* state, of all others, to grow fruit in; that we should believe in ourselves, in our soil, and in its great possibilities for fruit production, if properly handled.

George F. Platt, of Milford, spoke on "The Successful Cultivation of the Peach," in place of J. Norris Barnes, who was absent. He said that the great object in peach culture was to produce fine fruit that would pay a profit. He spoke of the poor outlook for a crop this year, of the peculiarity of buds being killed in certain localities in one season, and of their escaping in equally severe weather another season.

To make the buds more hardy, he suggested the sowing of oats early in the fall to check the growth; also the idea of spraying the trees with some gummy mixture to protect them from cold, after the manner of horse-chestnut buds, which are by nature so coated with a gummy substance.

The peach scab in Mr. Platt's orchard last season, he said had resulted in rotting and cracking of the fruit to the extent of three-fourths of the whole crop. He thought that Bordeaux spraying would be only partially successful. In the south spraying was thought to be of some use, but he thought that in a favorable season the scab was sure to appear, even after spraying. Champion was very susceptible to that disease; Fox Seedling also suffers badly with it. To succeed in peach growing a man must have energy, perseverance and a knowledge of the yellows; he must have faith that this section of the country is the very best for fruit growing, and faith in our markets also.

Mr. Platt was asked if he considered it worth while to spray for the peach rot. He thought that the Bordeaux would injure the foliage.

President Hale also said that in his orchards the Bordeaux had not given good results; it burned the leaves

badly, even in a very weak solution. He was afraid to spray peaches when in leaf. Cherries also suffered with this brown rot.

Mr. Hale further said that the matter was being studied by the United States Department of Agriculture on his farm, and that in the future we might hope to have more light on this subject. The only thing to be done now was to gather and burn the mummified fruit, and spray when the trees were dormant; then, when fruit was on, pick off the rotting specimens daily.

The question was asked if plowing under the mummified fruit would kill the rot. This had not been fully determined, but was thought to kill most of the spores of the rot.

Mr. Platt had sprayed peaches in dormant condition, but it helped to only partially prevent the rot.

Some one asked what fertilizers were best to use on peaches.

Mr. Rogers answered that it depended upon the soil; that different soils need different treatment. He liked ashes, if he could get good ones, and bone alternate years. He used 20 pounds of ashes to a tree in a nine-year-old orchard, also 20 pounds of bone, and these trees bore seven to twelve half-bushel baskets of fruit. He also put on nitrate of soda in July, as bearing trees could not be fertilized too much.

Mr. Sternberg said he had succeeded best with poor soil to begin with, as too rich soil invited the yellows. He did not believe in using too much nitrogen for peaches to begin with, but would rather use bone and potash in small quantities. This might not make as big trees, but he thought it would make more hardy ones.

Neither a loamy nor a gravelly soil was thought suitable for peaches.

Professor Gulley thought that the peach borer could easily be kept in check. He said that in winter they were often found in gum at the base of the trees.

Tobacco was recommended by some as a remedy for the borers.

Mr. Rogers spoke of a new disease, or trouble, in his section; this was a hard kernel in the fruit of the Elberta peach. No one else had seen this trouble.

"The Growing of Small Fruits for Home and Market" was treated by President J. H. Hale.

He said that since recent very low prices prevailed, market growers do not want to hear very much about small fruits, but, for home use they should be grown more extensively. Many farmers, who are not in the fruit-growing business, thought the family supply of fruit too small a matter to bother with,—they would buy all the family needed. "It was cheaper to buy than to raise such a small amount;" but they never did buy all the fruit the family wanted, and they never would: the only way was to grow it. The best market is the family need.

Berries could be grown so that the family would have a full supply for two or three months and also all they wanted to can for the winter. The family not only enjoyed this, but it was a healthful source of food supply.

President Hale thought that the old fenced garden idea should be done away with, and long strips of good open land planted,—land that could be cultivated with horse-power instead of the hand-hoe. If a farmer did not have time to go into the very best methods of culture and the choicest varieties, he could at least have a full supply of many of the most hardy varieties—even with quite indifferent culture.

Stable manure, he said, was a good fertilizer, but not quite well balanced enough. Commercial fertilizers rich in potash were better. Wood ashes was also good for fruits, but, in any case, give thorough cultivation, which would take the place of much fertilizer. The women were mostly responsible for all good family gardens. The speaker then gave a list of varieties of small fruits most suitable for a family supply, in Connecticut, as follows:

Strawberries.—Clyde, Haverland, Pride of Cumberland and Gandy.

Raspberries.—Among blackcaps, Palmer, Kansas, Cumberland; among reds, Columbian, Loudon, Cuthbert. Plant Golden Queen for a good yellow sort.

Blackberries.—Snyder, Eldorado, Lucretia.

Currants.—Wilder, Fay, Victoria.

Gooseberries.—Smith, Downing, Columbus.

Grapes.—Green Mountain, Moore's Early, Worden, Concord, Niagara, Brighton and Delaware, which would give two white, two red and three black varieties.

Commercial small-fruit growing, President Hale thought had been overdone the last two or three years; yet perhaps returns had been as good as from other branches in agriculture. People were buying more fruit every year, and so the demand seemed to be kept good, and prospects were brighter for higher prices in the near future.

Mr. Merriman asked as to the Cumberland raspberry.

Mr. Hale replied that it was so long it almost seemed to be a cross with a blackberry; it was a very large jet black berry, of fine quality and very promising. He thought it was going to be a money-maker.

In regard to grapes, Mr. Hale said that the Campbell's Early was not so good as the Concord, although it was better than the Champion.

In answer to a question in regard to the Delaware grape, Mr. Allen said that it needed good soil, spraying and careful pruning.

Woodruff Red was also highly recommended.

Mr. Hale regarded the Sample strawberry as a little off in quality, although of large size, a great yielder, very showy and as firm as Bubach.

Mr. Fawthrop said that the Eldorado blackberry seemed inclined to leaf-curl. In Mr. Hale's opinion it was of high quality and only a moderate bearer.

In answer to a question in regard to keeping grapes, Mr. Hale said the best way to keep them for family supply in winter was to pick them in good condition, wax the ends of the stems, pack them in paper-lined boxes or baskets, and tie the whole package up in paper. Keep in a cool, dry place, away from the air.

Mr. Allen favored keeping such grapes in rather a damp place.

N. H. Sherwood read a brief paper on "The Market End of Fruit Growing." He said the manner in which strawberries were picked made a great difference in marketing them; if they were carefully picked with the stems on they would keep longer. The same thing applied to peaches:

they should not be handled before picking. The telephone plays an important part in the marketing of fruit, enabling the fruit grower to keep in close touch with the markets.

In the discussion that followed, Mr. Sternberg said he thought fruit growers were coming to where they were willing to combine in selling their fruit products. He believed in commission men, but wanted to keep in close touch with his sellers; it kept them honest.

A movement, he said, was now on foot for the fruit growers of Hartford and vicinity to co-operate in selling their fruit.

Professor Gulley favored selling through a commission house in large cities, as it saved money; but in small towns it was better for the fruit grower to sell his own product —direct to the retailer, or possibly to families.

On motion of Mr. Merriman, it was voted that jail sentences should be worked out in improving our highways. Mr. Hale and Mr. Sternberg were nominated as delegates to legislative hearings, to further this movement.

The afternoon session opened at 1:30, with Vice-President Merriman in the chair.

The Question Box was opened for discussion.

Q. Is thinning apples practicable?

MR. IVES: Yes; and undoubtedly very profitable, as finest fruit cannot be secured when trees are overloaded.

Q. Is the time of the ripening of the Japanese plums yet fixed?

MR. JEWELL: No; they are quite irregular in their time of ripening.

Q. Are wild berries better flavored than cultivated ones?

MR. IVES: Strawberries left to ripen thoroughly on the vines are equal to the field berries.

In reply to a general question, it was generally conceded that spraying would not kill plum curculio: the only way to check its ravages is by placing sheets under the trees and jarring them early each morning. This is not as slow and expensive a process as at first appears. President Hale jars 50,000 trees daily in his Georgia orchards at very small cost.

Q. What are the indications when apple scab is present?

MR. PLATT: Apple scab shows first on the leaves; they look smutty, and there is a light streak along the rib. This disease causes more injury to apples in Connecticut than any other.

Q. When is the time to pick apples in this section?

MR. MERRIAM: Apples should be picked as soon after they are ripe as possible; do not pick when green. I had an experience of this kind and found that those picked when not ripe enough did not keep so well as those well colored.

After this discussion, the apple topic, so important to Connecticut farmers and fruit growers, was well handled in the following address:

SOME IMPORTANT POINTS IN THE CULTURE OF CHOICE APPLES

BY PROF. A. G. GULLEY

I think but few realize the value of the apple crop in this state. A great deal is said and written about the other fruits, but not much about this one. While no figures can be obtained, as Connecticut is not given to agricultural statistics, I venture to say that if the total value of the stone fruits, the small fruits and the other seed fruits grown in the state for any series of five years, could be compared with that of the apples grown in the state for the same time, the value of the latter would be the greatest. This result is obtained, too, with very little effort on the part of the grower, while much time and expense is given to produce crops of the others.

If one considers the possibilities of the apple crop, in relation to the places where it can be grown and the much greater certainty of producing apple crops as compared with that of producing the other fruits, then the apple is very far ahead.

One other point, not often considered in connection with apples, is that the market seeks the grower, and not the reverse, as is usually the case with most other fruits. The grower who can say he has a car-load of Baldwins or any other good market variety, or even of mixed varieties, need seldom leave his farm for a buyer.

With all these advantages it is still true that in Connecticut there are few well cared for, young orchards, and I might add that most old ones give but little evidence that their owners call them valuable. This neglect probably began with the decline of agriculture in New England, and, at first, did not show in the products of orchards. They then gradually failed till they did not seem profitable; perhaps they were not, but even yet they produce a crop of great total value, but not of

first grade fruit. To my mind many of these old neglected orchards it will never pay to try to put in good shape again. The same labor and expense put upon new ones will prove more profitable at the end of a series of years. Still there are many, not yet past redemption, that should be given a very severe pruning and thinning. Scrape and clean them up; after that feed the trees well and work up the land, if possible.

The land in Connecticut suitable for apple culture is not limited. Any land that is tillable, and not too wet, as light sand, will produce apples. If high, exposed hills are used, wind-breaks should be planted around and through the orchard. There is also much land not called tillable that could be made more profitable in apples than in any other way. For the best success, take the most desirable field, put it in good shape, and, after planting, follow with as good cultivation as for any other crop. Orchards planted the usual distances can be cropped for several years if properly fed. Or the trees may be planted much closer, giving the land up almost wholly to them, and thinned out when necessary.

If trees with straight trunks are wanted from the first, then plant the whole orchard to varieties that are thrifty growers, and top-graft the second year to such kinds as are needed. Pruning should begin with the planting and be continued, giving most attention the first few years to shaping the head and avoiding all crotches. After bearing size is reached, thinning out and keeping the head open is the most important point. A bearing orchard will hardly need a very thorough trimming more than every other year.

In either young or old orchards begin at once the war against disease, and, in the old ones at least, against insects as well. Right here rests the success or failure of growing apples, and here only thorough work will be successful. We may possibly grow fairly good apples with little or no cultivation, but the insects and diseases must be looked after.

We have to begin with codlin-moth, canker-worm, tent caterpillar, oyster-shell bark-louse, probably bud-moth and aphis; and with any, or all, apple scab is sure to be on hand. But against all these troubles we can protect ourselves with one process, and with nearly the same materials at the same operation. From all except bark-scale and aphis, the use of Bordeaux mixture and Paris green will protect us, if the spraying is repeated about four times; for the others we must use kerosene preparations. It seems probable that the new pumps will be able to do away with the use of emulsion.

Thinning apples is a work that will be a part of successful apple culture in the future. Mr. Clark, of Massachusetts, showed at our last annual meeting that it is both practicable and profitable. Certainly it would take no longer to pick the apples when small than later, and one could avoid the growing of wormy and misshapen specimens. I think the same apparatus that I have found a great help in picking apples could be used here; that is, a one-horse, high-platform wagon, with

steady horse, from which to do the work. The same outfit, slightly modified, has been recommended for pruning.

From published reports of exported apples, it is evident that there is room for much improvement in harvesting and packing apples. Much more care can be given to the grading. All should be put in at least three grades,—firsts, seconds, and culls or cider apples. A still higher grade could often be profitably used. Those in the same barrel should run of even size, whatever the grade.

What varieties to plant is a hard question to answer, and must depend largely upon the location of the grower. For a distant market plant only well known winter sorts, and few in number, which, in this state, means some of the following, of general value, about in the order named: Baldwin, Rhode Island Greening, Roxbury Russet, Cogswell, Hubbardston, Sutton, Peck's Pleasant and Red Canada. If where fall apples are in demand, then Gravenstein, Fall Pippin and Hurlbut can be named in addition. Red Astrachan, Oldenburg, Yellow Transparent and Golden Sweet will probably fill any call for summer apples.

A good family orchard should embrace not less than twenty-five kinds, about as follows: In the order of ripening, Sweet Bough, Golden Sweet, Primate, Williams' Favorite, Early Joe and Yellow Transparent, for early; Gravenstein, Jefferies, Late Strawberry, Snow, Keswick Codlin or Porter, Maiden's Blush, Hurlbut and Wealthy, for fall; Jacob's Sweet, Lady's Sweet, Jonathan, Dominie, Belle et Bonne, Baldwin, Rhode Island Greening, Roxbury Russet, Sutton, Cogswell, Hubbardston and Red Canada on Northern Spy stock, for winter varieties. This collection will give sweet and sour, good cooking and dessert apples through each season. Where the apple maggot is troublesome some of these kinds might be badly affected in some years. In any case, if the apple orchard is given the same thorough work that is deemed necessary with all other fruit crops, the returns will be large and much more certain.

In answer to questions and discussion, Professor Gulley said that the apple maggot hurts the summer apples very much, but that there was no help for this. The Northern Spy he thought good for market, but it fruited irregularly and was a slow grower, bearing well after twenty years.

In answer to a question as to fertilizers, Professor Gulley recommended potash and bone. Dutchess of Oldenburg he mentioned as a fine showy apple, that never grows very large trees. It is a good variety to use in a close-planted orchard. He would always plant apples close at first and thin later.

N. S. Platt opened the discussion on "The Outlook for Profitable Orcharding in Connecticut." "Connecticut," he said, "is the home of the apple, plum, pear, quince, and even

of the peach. Our varied soils, our suitable hillsides, nearby home markets, fine foreign markets, our people who demand and are willing to pay for good fruits, are quite enough to show us that orcharding is profitable and promises to pay."

Mr. Platt also urged the more extensive planting of apples. "Peaches, plums, and pears, too," he said, "are not likely to be overdone, as they are hard to grow and there are many diseases and insects, which discourage many people. We ought to plant more cherries; they would be profitable."

In line with Mr. Platt's talk, continuing the same discussion, there came the following paper:

THE OUTLOOK FOR PROFITABLE ORCHARDING IN CONNECTICUT

BY J. H. MERRIMAN

Success in any business depends largely upon circumstances. There are so many factors that enter into a successful business career, whether in manufacturing, mercantile or horticultural pursuits, that it would be very hard to say, in the aggregate, whether any business is really profitable. Many factories are run for years at a loss. In mercantile business the successes are largely in the minority. And so in horticulture: probably three-fourths of the trees set out fail to produce fruit. Two men with equal advantages as to location,—neighbors, we will suppose,—the one with good executive ability, a love for the business, a fair knowledge of its intricacies, and working on business principles, would stand a fair show to succeed; while his neighbor, lacking in one or more of these essential qualifications, would fail,—so much depends upon the man.

I will mention a few requisites of success: the right kind of a man, the proper location for an orchard, the selection of the right kind of fruit trees for the location, the proper setting of the trees, the trimming and shaping of the trees while young, the cultivation, the right kind of fertilizers, the proper picking, assorting and handling of the fruit so as to make it attractive to the purchaser, a keen foresight into the markets,—all are potent factors of success.

The manufacturer looks well to his environment before he builds his shop, else he is doomed to failure. No one would think of smelting ore in Connecticut, when the coal and the ore are 500 miles away. So the horticulturist would not think of setting an apple orchard in a low, sandy plain, nor a peach orchard in a low, level plain, either of sand or of muck. He would study the adaptability of the soil to the fruit he wished to produce.

We are to suppose, in this enlightened age, when science is combined with experience, and great benefit accrues to each one of us through the medium of this and kindred gatherings, where the most intelligent and successful horticulturists of our state and country meet

to tell of their successes as well as failures, where chemists and scientists disseminate knowledge to aid us to combat fungi and insects, and inform us what fertilizers are suited to certain fruits to produce the best results,—that with all these aids at our command, there can be no reason, as I see, why the outlook is not bright for horticulturists in Connecticut.

There are other factors that give us a decided advantage over many sections of our vast country: Our fruit is of the highest flavor, especially our peaches and apples, and our heavy, sterile soil is the home of the apple tree; and the New York and Chicago markets are beginning to appreciate the fact, so much so that we can compete with the west and beat them in their own markets. As for peaches, we are near the northern limit of successful culture; the crop often fails in Massachusetts when we are blessed with a crop; southern peaches are nearly gone when ours are in their prime, and, being so much inferior in flavor, our natives drive them from our markets.

Connecticut is the best market for fruit in the United States. The manufacturing interests will always stimulate our home market. I can see nothing but the stupidity of our Legislature in repealing the peach yellows law, to discourage us in the successful raising of peaches in this state. May we not hope that some time wiser counsels will prevail? If not, the time may come when the luscious peaches of the last few years will seem like a dream of the halcyon days that have passed into history.

Eternal vigilance to combat disease and insects, perseverance in cultivation, wise selection of varieties, judicious pruning, are factors that must enter into successful orcharding in Connecticut.

Mr. Morrill, at our last annual meeting in Hartford, told us of intensive culture, and was brimful of useful suggestions, but he could not see how we could raise anything but children on these rugged New England hills. We will admit that our Connecticut sons and daughters are the best fruit we have, and, like our apples and peaches, are of superior quality to those of any other state. We are proud of our noble birth.

Allow me to digress for a moment, and mention a few among the many worthy names:

Here's Hale, happy, and full of brains,
Makes ventures as well as gains;
Platt and Barnes, of lesser fame,
Yet bearing a most worthy name;
Old Gold, eighteen carats fine,
Makes the Cornwall hills to shine;
Hoyt's Sons it would greatly please
To plant the whole state with fruit trees,
And combine to sell the fruit,
But this many would not suit;
Butler and Jewell fain would run
Our minds aground upon the plumb;

We go two Miles to pay our dues,—
Joyful, genial, he'll ne'er refuse;
One dollar makes happy for a year,
Give down: 'twill bring good cheer;
A. C. Sternberg, of high estate,
Will talk peaches early and late;
Professors Jenkins and Sturgis experiment
To improve our environment;
And Professor Gulley, almost sublime,
Science and practice doth combine;
There is Moore, who handles our cash,
So honest his accounts never clash;
And C. I. Allen would entwine
Our hearts about with a grape-vine,
Whose Eshcol clusters none deny
Tickle the palate and please the eye;
To speak of self would not be nice,
Alas! alas! too full of *vice*;
Connecticut! who's not proud to be
stigmatized as a Yankee?
Then let our State motto remain,
"He who planted will sustain."

Mr. Ives, of Meriden, said the demand for *good* fruit was always good, and we need have no fear of its failing. Fine apples are wanted in New York, and the price is no consideration. The west, he thought, was not to be feared as a competitor, when we have the advantage of near-by markets. Eastern growers must improve the quality of their apples. We must thin our fruit, and this, in the end, would cause a more uniform bearing of trees.

Professor Britton recommended Bordeaux mixture to cover the wounds made by sawing off large branches of trees.

Mr. Platt said there was nothing better than white lead paint for this purpose. Trimming should always be done in spring, as the sap starts; the healing is then done quickly.

The following resolution was unanimously passed:

Resolved, That the thanks of this Pomological Society be extended to the Mattabessett Grange and the members of their committee, who have entertained us so hospitably, and to the speakers and all others who have contributed to make this meeting a success.

The meeting adjourned at 4:15 P. M., with 250 in attendance.

SECOND ANNUAL FALL MEETING AND EXHIBITION OF FRUITS (1899)

THE results of the Society's first exhibition, held in 1898, were so gratifying that plans were early considered for a similar event in 1899. Accordingly, the Second Annual Exhibition took place in the Town Hall of Meriden, October 3 and 4, 1899. The following list of premiums had been offered:

LIST OF PREMIUMS

FIRST DIVISION — COLLECTIONS

<i>Class</i>		<i>1st</i>	<i>2d</i>	<i>3d</i>
1.	Best collection of fruits by grower, of which not more than two-thirds are to be of apples	\$5 00	\$2 50	\$1 00
2.	Best collection, 20 varieties of apples	5 00	2 50	1 00
3.	Best collection, 12 varieties of apples	3 00	1 50	75
4.	Best collection, 5 varieties of apples for market.	2 00	1 00	50
5.	Best collection, 12 varieties of pears	5 00	2 50	1 00
6.	Best collection, 6 varieties of pears for market.	2 00	1 00	50
7.	Best collection, 12 varieties of grapes	5 00	2 50	1 00

SECOND DIVISION — SINGLE PLATES

<i>Class</i>		<i>1st</i>	<i>2d</i>	<i>3d</i>	<i>4th</i>
1.	Best single plates of following varieties of apples, each	\$1 50	\$0 75	\$0 50	\$0 25
	Fameuse, Gravenstein, Hurlbut, Oldenburg, Twenty Ounce, Red Bietigheimer, Fall Pippin, Porter, Maiden Blush, Wealthy, Tolman Sweet, Baldwin, Cogswell, Hubbardston, Jonathan, King, Northern Spy, Red Canada, Wagener, Lady, Westfield, York Imperial, Jacob's Sweet, Belle et Bonne, Golden Russet, Roxbury Russet, Longfield, Newtown Pippin, Peck's Pleasant, Rhode Island Greening, and of other worthy varieties not to exceed ten.				

Class		1st	2d	3d	4th
2.	Best single plates of following varieties of pears, each	\$1 50	\$0 75	\$0 50	\$0 25
	Angouleme, Bartlett, Bosc, Louise Bonne, Diel, Onondaga, Anjou, Lucrative, Boussock, Buffum, Flemish Beauty, Howell, Mt. Vernon, Seckel, Clairgeau, Lawrence, Sheldon, Easter Beurre, Kieffer, and of other worthy varieties not to exceed ten.				
3.	Best single plates of following varieties of grapes, each	1 50	75	50	25
	Brighton, Concord, Eaton, Hartford, Wilder, Worden, Isabella, Agawam, Delaware, Diana, Iona, Lindley, Salem, Empire State, Martha, Niagara, Pocklington, and of other worthy varieties not to exceed ten.				
4.	Peaches and plums, each valuable variety.	1 50	75	50	25
5.	Quinces, each valuable variety	1 50	75	50	25
6.	Grapes grown under glass, one bunch, each variety	1 00	50	25	

THIRD DIVISION — CANNED FRUITS AND JELLIES

Class		1st	2d	3d
1.	Best collection canned fruits, ten or more varieties	\$5 00	\$2 50	\$1 00
2.	Best collection of pickles, six or more, one quart each	2 00	1 00	50
3.	Best collection jellies, six or more	2 00	1 00	50
4.	Best single can of any of the above, each variety	1 00	50	25
5.	Best sample of unfermented fruit juice, each kind	1 00	50	25

FOURTH DIVISION — NUTS, ETC.

Class		1st	2d	3d
1.	Best specimen any variety of cultivated nuts .	\$1 00	\$0 50	\$0 25
2.	Best sample of native nuts, any kind	1 00	50	25
3.	Best collection of native nuts, correctly named, by boy or girl	2 50	1 25	50
4.	Articles not classified, for which discretionary premiums may be awarded.			

RULES OF THE EXHIBITION

1. All articles entered, except in Fourth Division, must be grown or prepared by the exhibitor.

2. All fruits shall be correctly labeled (if possible) and, excepting grapes and crab apples, five specimens, neither more nor less, shall make a plate, either single or in collections.

Of crab apples, ten specimens, and of grapes, three bunches shall make a plate, except where noted. The collection, also, shall embrace just the required number of plates.

3. No exhibitor shall make more than one entry for the same premium, nor enter the same plate for more than one premium.

4. In the market collections the value of the varieties shown, as well as the condition of the specimens, will be considered in making the award.

5. Premiums will be awarded to members of the Society only.

6. As the object of the Society is to encourage the growth of fruits of fine quality, wormy or diseased specimens will rank very low in making awards.

7. *All fruit for exhibition must be entered and in place during the first day of the meeting, Tuesday, October 3.*

Winners of premiums may expect to be called upon to contribute fruits for the Paris Exposition.

There were nearly 500 separate entries upon the tables, and they made a magnificent showing. N. S. Platt, State Pomologist, had charge of the exhibits, and was ably assisted by Professor A. G. Gulley, Stancliffe Hale, G. S. Butler, R. A. Moore and others. Professor W. E. Britton rendered valuable assistance in the work of the Secretary's office.

The following were appointed as judges: Single plates apples, George T. Powell, Ghent, N. Y.; collections of apples, Professor A. G. Gulley, Storrs College; single plates pears, G. S. Butler, Cromwell; collections of grapes, R. A. Moore, Kensington; single plates grapes, Charles Leigey, Berlin; peaches, plums and quinces, J. H. Merri man, New Britain; canned fruits, Dennis Fenn, Milford; nuts, L. B. Yale, Meriden.

After very careful work on the part of these judges, the following awards, amounting to a total of \$274, were announced:

PREMIUMS AWARDED

BEST COLLECTION OF FRUITS BY GROWER.

C. I. Allen, Terryville. First, \$5.

19 varieties of apples, 3 of pears, 3 of quinces, 4 of plums, 1 of raspberries, 26 of grapes.

COLLECTION OF 12 VARIETIES OF GRAPES.

C. I. Allen, Terryville. First, \$5.

Adolph Werking, Plantsville. Second, \$2.50.

APPLES

COLLECTION OF 20 VARIETIES OF APPLES.

E. C. Warner, Fair Haven P. O. First, \$5.

C. I. Allen, Terryville. Second, \$2.50.

COLLECTION OF 12 VARIETIES OF APPLES.

George F. Platt, Milford. First, \$3.

E. Manchester, Bristol. Second, \$1.50.

C. I. Allen, Terryville. Third, 75 cts.

COLLECTION OF 5 VARIETIES FOR MARKET.

Arthur C. Yale, Yalesville. First, \$2.

C. I. Allen, Terryville. Second, \$1.

J. H. Yale, Meriden. Third, 50 cts.

SINGLE PLATES OF APPLES.

Baldwin.

J. H. Merriman, Southington. First, \$1.50

J. J. Wilcox, Meriden. Second, 75 cts.

E. Manchester, Bristol. Third, 50 cts.

Arthur C. Yale, Yalesville. Fourth, 25 cts.

Rhode Island Greening.

Leroy A. Smith, Higganum. First, \$1.50.

E. C. Warner, Fair Haven P. O. Second, 75 cts.

E. Manchester, Bristol. Third, 50 cts.

J. E. Andrews, New Britain. Fourth, 25 cts.

Fall Pippin.

H. E. Savage, East Berlin. First, \$1.50.

Orrin Gilbert, Middletown. Second, 75 cts.

J. H. Yale, Yalesville. Third, 50 cts.

King.

Leroy A. Smith, Higganum. First, \$1.50.

E. C. Warner, Fair Haven P. O. Second, 75 cts.

W. E. Wilcox, Meriden. Third, 50 cts.

S. A. Griswold, West Hartford. Fourth, 35 cts.

Fallawater.

E. C. Warner, Fair Haven P. O. First, \$1.50.

C. I. Allen, Terryville. Second, 75 cts.

A. R. Yale & Co., Yalesville. Third, 50 cts.

Arthur C. Yale, Yalesville. Fourth, 25 cts.

Peck's Pleasant.

Leroy A. Smith, Higganum. First, \$1.50.
 J. H. Yale, Meriden. Second, 75 cts.
 J. H. Merriman, Southington. Third, 50 cts.
 H. O. Griswold, West Hartford. Fourth, 25 cts.

Hurlbut.

E. Manchester, Bristol. First, \$1.50.
 E. C. Warner, Fair Haven. Second, 75 cts.
 C. I. Allen, Terryville. Third, 50 cts.
 Arthur C. Yale, Yalesville. Fourth, 25 cts.

Northern Spy.

H. C. C. Miles, Milford. First, \$1.50.
 E. C. Warner, Fair Haven. Second, 75 cts.
 Arthur C. Yale, Yalesville. Third, 50 cts.
 C. I. Allen, Terryville. Fourth, 25 cts.

Tolman Sweet.

Huber Bushnell, Berlin. First, \$1.50.
 E. C. Warner, Fair Haven. Second, 75 cts.
 N. S. Baldwin, Meriden. Third, 50 cts.
 H. O. Griswold, West Hartford. Fourth, 25 cts.

Hubbardston.

E. C. Warner, Fair Haven. First, \$1.50.
 H. E. Savage, East Berlin. Second, 75 cts.
 J. E. Andrews, North Britain. Third, 50 cts.
 N. S. Baldwin, Meriden. Fourth, 25 cts.

Twenty-Ounce.

C. I. Allen, Terryville. First, \$1.50.
 A. J. Pierpont, Waterbury. Second, 75 cts.
 H. C. C. Miles, Milford. Third, 50 cts.
 Joseph Albison, South Manchester. Fourth, 25 cts.

Belle et Bonne.

J. H. Hale, South Glastonbury. First, \$1.50.
 Abner Trask, Silver Lane. Second, 75 cts.

Roxbury Russet.

Leroy A. Smith, Higganum. First, \$1.50.
 C. I. Allen, Terryville. Second, 75 cts.
 Arthur Yale, Yalesville. Third, 50 cts.

Wagener.

C. I. Allen, Terryville. First, \$1.25.

Gravenstein.

C. I. Allen, Terryville. First, \$1.50.
 E. C. Warner, Fair Haven. Second, 75 cts.
 A. J. Pierpont, Waterbury. Third, 50 cts.

Fameuse.

T. S. Gold, West Cornwall. First, \$1.50.
 A. J. Pierpont, Waterbury. Second, 75 cts.
 Joseph Albison, South Manchester. Third, 50 cts.

Pound Sweet.

J. H. Hale, South Glastonbury. First, \$1.50.

Porter.

E. C. Warner, Fair Haven. First, \$1.50.
H. E. Savage, East Berlin. Second, 75 cts.
H. C. C. Miles, Milford. Third, 50 cts.

English Russet.

Arthur C. Yale, Yalesville. First, \$1.50.
C. I. Allen, Terryville. Second, 75 cts.

Bellflower.

C. I. Allen, Terryville. First, \$1.50.
R. T. Cook, Meriden. Second, 75 cts.

Westfield Seek-No-Further.

A. J. Pierpont, Waterbury. First, \$1.50.
E. Manchester, Bristol. Second, 75 cts.
R. T. Cook, Meriden. Third, 50 cts.

Gilliflower.

E. Manchester, Bristol. First, \$1.50.
E. C. Warner, Fair Haven. Second, 75 cts.

Red Canada.

H. O. Griswold, West Hartford. Second, 75 cts.

McClellan.

S. A. Griswold, West Hartford. First, \$1.50.

American Golden Russet.

H. E. Savage, East Berlin. Second, 75 cts.

Newtown Spitzenberg.

H. E. Savage, East Berlin. Second, 75 cts.

Grimes' Golden.

Arthur C. Yale, Yalesville. First, \$1.50.

Esopus Spitzenberg.

E. C. Warner, Fair Haven. First, \$1.50.

Vandevere.

E. C. Warner, Fair Haven. First, \$1.50.
M. W. Frisbie, Southington. Second, 75 cts.

Connecticut Seek-No-Further.

E. C. Warner, Fair Haven. First, \$1.50.

Cheeseborough Russet.

T. S. Gold, West Cornwall. First, \$1.50.
E. Manchester, Bristol. Second, 75 cts.
Huber Bushnell, Berlin. Second, 75 cts.

Golden Russet.

E. Manchester, Bristol. First, \$1.50.

Maiden's Blush.

Leroy Smith, Higganum. Second, 75 cts.

Blue Pearmain.

T. S. Gold, West Cornwall. First, \$1.50.
W. E. Wilcox, Meriden. Second, 75 cts.

Walter Pears.

H. L. Fairchild, Nichols. Second, 75 cts.

PEARS

SINGLE PLATES OF PEARS.

Clairgeau.

R. T. Cook, Meriden. First, \$1.50.
Connecticut Agricultural College. Second, 75 cts.
Adolph Werking, Plantsville. Third, 50 cts.

Bosc.

H. O. Griswold, West Hartford. First, \$1.50.
J. E. Andrews, North Britain. Second, 75 cts.
N. S. Baldwin, Meriden. Third, 50 cts.
Abner Trask, Silver Lane. Fourth, 25 cts.

Anjou.

A. R. Yale & Co., Yalesville. First, \$1.50.
H. O. Griswold, West Hartford. Second, 75 cts.
E. Manchester, Bristol. Third, 50 cts.
E. C. Warner, Fair Haven. Fourth, 25 cts.

Seckel.

E. Manchester, Bristol. First, \$1.50.
H. C. C. Miles, Milford. Second, 75 cts.
H. O. Griswold, West Hartford. Third, 50 cts.
A. J. Pierpont, Waterbury. Fourth, 25 cts.

Lawrence.

E. Manchester, Bristol. First, \$1.50.
C. I. Allen, Terryville. Second, 75 cts.
E. C. Warner, Fair Haven. Third, 50 cts.
H. O. Griswold, West Hartford. Fourth, 25 cts.

Sheldon.

E. C. Warner, Fair Haven. First, \$1.50.
H. O. Griswold, West Hartford. Second, 75 cts.
A. J. Pierpont, Waterbury. Third, 50 cts.
N. S. Baldwin, Meriden. Fourth, 25 cts.

Kieffer.

Connecticut Agricultural College. First, \$1.50.
Joseph Albison, South Manchester. Second, 75 cts.
H. O. Griswold, West Hartford. Third, 50 cts.
A. J. Pierpont, Waterbury. Fourth, 25 cts.

Louise Bonne.

H. O. Griswold, West Hartford. First, \$1.50.
A. J. Pierpont, Waterbury. Second, 75 cts.
Connecticut Agricultural College. Third, 50 cts.
Charles Liegey, Beckley. Fourth, 25 cts.

Bartlett.

E. C. Warner, Fair Haven. First, \$1.50.

Buffum.

C. I. Allen, Terryville. First, \$1.50.

E. C. Warner, Fair Haven. Second, 75 cts.

Pratt.

H. O. Griswold, West Hartford. First, \$1.50.

Onondaga.

H. O. Griswold, West Hartford. Second, 75 cts.

Charles Liegey, Beckley. Third, 50 cts.

Dana's Hovey.

Joseph Albison, South Manchester. Second, 75 cts.

H. L. Fairchild, Nichols. Third, 50 cts.

Virgalein.

Orrin Gilbert, Middletown. Third, 50 cts.

Northford Seedling.

E. C. Warner, Fair Haven. Second, 75 cts.

H. B. Curtis, Cheshire. Third, 50 cts.

Goodale.

E. Manchester, Bristol. First, \$1.50.

Clapp's Favorite.

E. C. Warner, Fair Haven. Second, 75 cts.

Howell.

E. C. Warner, Fair Haven. First, \$1.50.

Connecticut Agricultural College. Second, 75 cts.

Leconte.

J. E. Andrews, North Britain. First, \$1.50.

Garber.

H. L. Fairchild, Nichols. First, \$1.50.

President Drouard.

H. L. Fairchild, Nichols. Second, 75 cts.

GRAPEs

SINGLE PLATES OF GRAPEs.

Concord.

C. I. Allen, Terryville. First, \$1.50.

R. A. Moore, Kensington. Second, 75 cts.

S. W. Roberts, Middletown. Third, 50 cts.

E. C. Warner, Fair Haven. Fourth, 25 cts.

Worden.

C. I. Allen, Terryville. First, \$1.50.

Joseph Albison, South Manchester. Second, 75 cts.

H. B. Curtis, Cheshire. Third, 50 cts.

R. A. Moore, Kensington. Fourth, 25 cts.

Pocklington.

Abner Trask, Silver Lane. First, \$1.50.

C. I. Allen, Terryville. Second, 75 cts.

H. C. C. Miles, Milford. Third, 50 cts.

Moore's Early.

C. I. Allen, Terryville. First, \$1.50.

Abner Trask, Silver Lane. Second, 75 cts.

Adolph Werking, Plantsville. Third, 50 cts.

Niagara.

R. A. Moore, Kensington. First, \$1.50.

C. I. Allen, Terryville. Second, 75 cts.

Adolph Werking, Plantsville. Third, 50 cts.

N. S. Baldwin, Meriden. Fourth, 25 cts.

Eaton.

Abner Trask, Silver Lane. First, \$1.50.

C. I. Allen, Terryville. Second, 75 cts.

Vergennes.

Adolph Werking, Plantsville. First, \$1.50.

M. W. Frisbie, Southington. Second, 75 cts.

Brighton.

M. W. Frisbie, Southington. First, \$1.50.

Adolph Werking, Plantsville. Second, 75 cts.

C. I. Allen, Terryville. Third, 50 cts.

N. S. Baldwin, Meriden. Fourth, 25 cts.

Delaware.

C. I. Allen, Terryville. First, \$1.50.

Adolph Werking, Plantsville. Second, 75 cts.

Clinton.

Adolph Werking, Plantsville. Fourth, 25 cts.

Wilder.

Adolph Werking, Plantsville. First, \$1.50.

C. I. Allen, Terryville. Fourth, 25 cts.

Diana.

A. J. Pierpont, Waterbury. First, \$1.50.

Adolph Werking, Plantsville. Second, 75 cts.

Isabella.

E. C. Warner, Fair Haven. First, \$1.50.

Agawam.

C. I. Allen, Terryville. First, \$1.50.

E. C. Warner, Fair Haven. Fourth, 25 cts.

Early Victor.

C. I. Allen, Terryville. First, \$1.50.

E. C. Warner, Fair Haven. Third, 50 cts.

Victoria.

R. A. Moore, Kensington. First, \$1.50.

C. I. Allen, Terryville. Second, 75 cts.

Diamond.

C. I. Allen, Terryville. First, \$1.50.

R. A. Moore, Kensington. Second, 75 cts.

Lindley.

C. I. Allen, Terryville. First, \$1.50.

Wyoming Red.

C. I. Allen, Terryville. Second, 75 cts.

Empire State.

C. I. Allen, Terryville. First, \$1.50.

Moyer.

C. I. Allen, Terryville. Fourth, 25 cts.

Massasoit.

C. I. Allen, Terryville. Third, 50 cts.

Woodruff Red.

C. I. Allen, Terryville. Second, 75 cts.

Catawba.

C. I. Allen, Terryville. First, \$1.50.

Duchess.

C. I. Allen, Terryville. First, \$1.50.

Ulster Prolific.

C. I. Allen, Terryville. Third, 50 cts.

Jefferson.

C. I. Allen, Terryville. Second, 75 cts.

French Seedling.

Charles Liegey, Beckley. Second, 75 cts.

PEACHES

E. C. Warner, Fair Haven.

Elberta. First, \$1.50.

Crawford's Late. First, \$1.50.

Crosby. First, \$1.50.

Freehold. First, \$1.50.

Oldmixon. First, \$1.50.

Stump the World. First, \$1.50.

Fox Seedling. Second, 75 cts.

Wonderful. Second, 75 cts.

Keyport White. Second, 75 cts.

W. M. Tyler, Waterbury.

Crosby. Second, 75 cts.

Smock. Second, 75 cts.

Late White. Second, 75 cts.

Ironclad. Third, 50 cts.

PLUMS

H. C. C. Miles, Milford.

Satsuma. First, \$1.50.

Chabot. Second, 75 cts

QUINCES

Champion.

H. O. Griswold, West Hartford. First, \$1.50.
 Adolph Werking, Plantsville. Second, 75 cts.
 E. C. Warner, Fair Haven. Third, 50 cts.
 Jos. Albison, South Manchester. Fourth, 25 cts.

Orange.

C. I. Allen, Terryville. First, \$1.50.
 J. E. Andrews, North Britain. Second, 75 cts.
 A. R. Yale, Yalesville. Third, 50 cts.

Fuller.

C. I. Allen, Terryville. Second, 75 cts.

Angers.

J. E. Andrews, North Britain. Second, 75 cts.

CANNED FRUITS

Mrs. Huber Bushnell, Berlin.
 25 varieties. First, \$5.
 Mrs. Orrin Gilbert, Middletown.
 11 varieties. Second, \$2.50.

COLLECTION OF PICKLES.

Mrs. Harvey Jewell.
 10 jars. First, \$2.

COLLECTION OF JELLIES.

Adolph Werking, Plantsville.
 15 varieties. First, \$2.

SINGLE CANS OF FRUITS AND JELLIES.

Adolph Werking, Plantsville.
 Strawberries. First, \$1.
 Grapes. First, \$1.
 Astrachan apple. First, \$1.
 Washington plum. First, \$1.
 Bradshaw plum. First, \$1.
 Quince. First, \$1.
 Cherries. First, \$1.
 Sheldon pears. First, \$1.
 Plums. First, \$1.

Mrs. H. B. Curtis, Cheshire.
 Crawford peach. First, \$1.
 Peach jelly. First, \$1.
 Peach and crab apple jelly. First, \$1.
 Red currant jelly. First, \$1.
 Strawberry. Third, 25 cts.

Mrs. Harvey Jewell, Cromwell.

 Satsuma plum. First, \$1.

 Chabot plum. First, \$1.

 Burbank plum. First, \$1.

 Oldmixon peach. First, \$1.

 Crosby peach. First, \$1.

Mrs. Orrin Gilbert, Middletown.

 Oxheart cherries. First, \$1.

 Strawberries. Second, 50 cts.

J. E. Andrews, New Britain.

 Early Richmond cherries. First, \$1.

 Cuthbert raspberries. First, \$1.

 Watermelon, Sweet-Pickle. First, \$1.

 Orange quince. Second, 50 cts.

UNFERMENTED FRUIT JUICE.

Grape juice.

Adolph Werking, Plantsville. First, \$1.

Mrs. Harvey Jewell, Cromwell. Second, 50 cts.

N. N. King, Thompsonville. Third, 25 cts.

NUTS

SPECIMENS OF CULTIVATED NUTS.

Chestnuts.

J. H. Hale, South Glastonbury.

 Coe. First, \$1.

 Hale. First, \$1.

 McFarland. First, \$1.

 Paragon. First, \$1.

A. J. Pierpont, Waterbury.

 Paragon. Second, 50 cts.

W. E. Britton, New Haven.

 American. First, \$1.

NATIVE NUTS.

Hickory-nuts.

N. S. Baldwin, Meriden. First, \$1.

J. E. Andrews, North Britain. Second, 50 cts.

J. J. Wilcox, Meriden. Third, 25 cts.

Black Walnuts.

N. C. Baldwin, Meriden. First, \$1.

Butternuts.

J. E. Andrews, North Britain. First, \$1.

G. F. Platt, Milford. Second, 50 cts.

Chestnuts.

H. L. Fairchild, Nichols. First, \$1.

Roy C. Gulley, Storrs. Third, 25 cts.

COLLECTION OF NATIVE NUTS.

Roy C. Gulley, Storrs. First, \$1.

DISCRETIONARY PREMIUMS

BASKET OF ASSORTED FRUIT.

N. S. Baldwin, Meriden. First, \$1.

H. L. Fairchild, Nichols.

Japan Quince, Red-Flowering. First, \$1.

After the evening session of October 3 had been called to order, President Hale introduced Mayor Ives, of Meriden, who spoke kind words of greeting.

President Hale then explained the object of the Society and what had led up to a successful exhibition like this. The purpose of the Society was to show the difference between good and poor fruit, and the possibilities of intelligent soil culture in Connecticut.

Secretary Gold, of the State Board of Agriculture, was introduced and spoke briefly. The Society, he said, was a traveling horticultural high school. Its members had come to Meriden because they wanted to do Meriden some good in the line of pomology.

George T. Powell, of Ghent, N. Y., was next introduced, and spoke on the "Refinements of Horticulture." After demonstrating the fact that horticulture is the most refining of all occupations, he said, in brief :

"We want to see the products of the soil reach the same state of perfection as our manufactured products, and go to the markets of all the world. In England horticultural work is worth more than in this country. There is no comparison between the fruit of the western and eastern sections of the country. What the markets want is quality, and we are going to give it to them. The abandoned farms can be made to pay in producing such fruit. There is no exhausted land in New England; all of it can be made to produce fine fruits. It is not extensive culture that we want, but intensive culture.

"Small fruit culture promises great things to Connecticut land-owners. Clover should be used to improve the soil and to furnish plant-food. Red clover plowed under in the fall is good for strawberries. Seed to crimson clover in late summer and plow this in early next spring in time for strawberry planting.

"The color of the exhibited fruit shows that our soil is

not lacking in potash, and clover will draw out the potash and phosphoric acid. We should believe in our soil and our rural towns, and not talk of abandoned farms. The time is coming when we will see a great return to the soil. The Meriden apple exhibit was one of the finest I have seen this year. Our Society should never allow a premium to be awarded to a single imperfect specimen; there is a great work before the Society in this respect, as this rule, strictly adhered to, would raise the standard of fruit culture.

"I am sorry to see the Ben Davis at our exhibition, as this kind of fruit lowers the taste of the consumer, and breaks down the demand for good apples. I would recommend the raising of Sutton Beauty and Jonathan instead; these are of extra high quality, 100 per cent better than the good old Baldwin. Spitzenberg, with the right care, would pay better than any other variety. Let us stand by the good old Greening; extra choice, selected apples of this variety sold at \$6 per bushel box last year.

"It is not now necessary to wait fifteen or twenty years for apple trees to bear. We can top-work on strong-growing sorts of the best buds selected from finest trees. I use Northern Spy for the stock. There are great possibilities in this direction, as wonderful results are to be had in early bearing of finest apples."

In reply to questions, Mr. Powell recommended later and more thorough cultivation and the use of clover, even though only a small growth is secured. Cow peas he considered good, but they do not grow as late as clover. Clover could be sown up to the first of August.

The afternoon meeting of October 4 was called to order at 2 P. M., by President Hale.

The awards, as made, were criticised and discussed by J. H. Merriman.

Professor Gulley said that there was a great difference between big specimens and best specimens; this would explain some of the awards.

H. L. Fairchild thought that even a single plate of fruit should get first premium if worthy, and not second; he

suggested that a scale of points be arranged, and the fruits exhibited worked up to it.

Mr. Moore spoke of the progress that had been made in apples in the last fifty years, yet noticed that many of the old sorts were in the lead now.

George F. Platt referred to the matter of spraying apples.

Mr. Moore used only Paris green, but this plan was not recommended, and the general opinion was that only Bordeaux should be used.

Mr. Powell said :

"In placing the awards on the apples in your exhibit, quality was the determining principle, and the standard was put high. Often in exhibitions of pomological societies much of the fruit has not been very far superior to that which could be found in the general market, but your exhibit, in point of superior quality, was exceptional.

"I have never seen a finer collection of Rhode Island Greenings. Out of a collection of nearly thirty single plates the competition fell closely upon four. To determine the award slight defects had to be dealt with, which took one specimen out of each plate, leaving the four in exactly the same position as before. Then the finest points had to be determined, uniformity in size, clearness in color, and fineness of texture, and these points finally made it possible to place the premiums justly and correctly.

"In the general market size, all other points being equal, determines the higher value. In a special market, superior quality in medium size will command the higher value. In placing awards on your exhibit I have considered both markets, according to the variety.

"There would be especial value in your exhibits, if, in making entries, exhibitors would accompany them with statements as to the character of the soil, whether trees are under cultivation or in sod, and whether they have been sprayed or not. This would not only be highly instructive to all fruit growers and to the public, but it would be helpful to the judges to know the conditions under which the fruit was grown.

"Your exhibit of Kings was especially fine, as of several other varieties that are worthy of particular mention.



THE MEETING ON THE LAWN AFTER LUNCH.
A field meeting with President J. H. Hale.



BLOCK OF 80,000 YOUNG PEACH TREES IN STEPHEN HOYT'S SONS' NURSERIES.



SHOWING THE PRODUCTIVENESS OF THE JAPANESE PLUMS.
For best results, *thin* the fruit severely.

FIELD MEETINGS OF THE SOCIETY

EARLY in the history of the Society members realized that the brightest thought and most practical discussion could be brought out in the field, around tree, plant or vine. So it was decided that one important feature of its work should be summer meetings on the farms of its members, devoting the morning hour to field inspection, questions and informal discussion, noon to a picnic lunch, and the afternoon to a calling together of the Society, with the host as leading speaker, to briefly explain his work, method and results. His speech was to be followed by short addresses on various topics furnished by his remarks and the morning inspection. Now, after seven years of experience in these field meetings, two to four each season, it is the firm belief of those best informed that they have had greater educational power than any other horticultural meetings ever held in America, and they will ever be a leading feature in the work of this Society.

The first field meeting of which the Society has any record was held at South Glastonbury, in the strawberry season of 1894, on the farm of J. H. Hale. Strawberry fields of many acres and varieties, and some sixty acres of peach orchards, were the main point of interest.

The next meeting was in Meriden, on the farm of the late A. J. Coe, where cherries, grapes, apples, and cold storage houses were a leading feature.

The Connecticut Valley orchard, at Berlin, with its many thousand peach trees, with apples set between, attracted the attention of the Society in 1895.

August 21, 1896, the berry and melon farm of J. C. Eddy, at Simsbury, with its extensive irrigating plant, operated by several very large rams, was the center of interest.

The next field meeting visited the farm and nursery of

Stephen Hoyt's Sons, at New Canaan, with the new Green Mountain grape, just ripening, as a leading feature.

June 15, 1897, on the farm of President J. H. Hale, at South Glastonbury, was gathered the largest and most important meeting ever held by the Society. Upon invitation large delegations were present from the state horticultural societies of Maine, New Hampshire, Massachusetts, Rhode Island, eastern New York, New Jersey, Pennsylvania, Delaware and Maryland, as well as from the Massachusetts Fruit Growers' Association and Massachusetts, Rhode Island, and New Jersey State Boards of Agriculture; so that besides some 300 Connecticut fruit growers there were in attendance nearly one hundred of the most prominent fruit growers of the northeastern states of our Union.

Since the last visit of the Society, President Hale had added largely to the acreage of fruits under cultivation, so that nearly two hundred acres of peach orchards, many thousands of Japanese plums, 35 acres of strawberries, experimental plots of many new fruits, and considerable space devoted to chestnuts grafted on native sprouts, were features of interest.

The great center of interest, however, was the irrigating plant, some sixty acres of the farm being piped under ground and abundantly supplied by water from a storage reservoir back on the hills. Sub-irrigation from perforated iron pipes, surface irrigation in open ditches and from troughs with water-gates at each row of strawberries, showed the turning of water into fruits in a most practical manner, and new lessons were learned by nearly all present.

After lunch in the apple orchard, a general fruit growers' conference was organized, with Hon. Franklin Dye, of New Jersey, as chairman. Addresses were made by Professor Wesley Webb, of Dover, Delaware; W. F. Taber, of Poughkeepsie, vice president of the eastern New York society; George A. Rogers, horticultural editor of *New England Farmer*; W. F. Allen, Jr., Salisbury, Maryland; Professor E. H. Jenkins, Connecticut Agricultural Experiment Station; Professor W. A. Taylor, Assistant Pomologist U. S. Department of Agriculture, Washington,

D. C.; Hon. J. M. Hubbard, Peach Commissioner of Connecticut; Hon. W. R. Sessions, Secretary Massachusetts State Board of Agriculture, and Hon. T. S. Gold, Secretary of Connecticut State Board of Agriculture.

The leading thought running through all the addresses was the new agriculture and the wonderful possibilities of horticultural production, as shown by the work at Hale farm.

The visitors all claimed to have caught wonderful inspiration from the "field meeting" idea of our Society.

August 11, 1897, at the Butler & Jewell farm, Cromwell, a large meeting of the Society inspected the first large orchard of Japanese plums in full fruitage in this state. Some eight or ten acres thickly planted with Abundance, Burbank, Chabot and Satsuma plums attracted great attention and admiration. Young peach orchards and great fields of small fruits under clean culture were also a feature of the day, enjoyed by some 150 of our members.

August 23, 1898, at the farm of A. N. Farnham, New Haven, a largely attended meeting of the Society found nearly 400 acres of land under a high state of cultivation in market-gardens and small fruits, and a system of business organization remarkable for its completeness in detail.

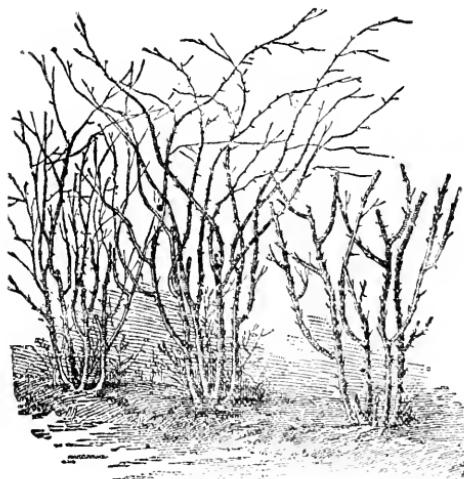
September 20, 1898, C. I. Allen, of Terryville, invited the Society to visit his farm and inspect the orchards of quinces, pears, plums and apples, the berry fields and the grape vineyards, that make this farm so justly famous.

June 15, 1899, at the farm of E. C. Warner, North Haven, a wonderful yield of Sharpless strawberries under irrigation attracted great attention, as did also large peach orchards and old apple orchards under most thorough cultivation.

At Southport, August 2, 1899, the Society field meeting was at Nellis Sherwood's place. Here some fifteen acres of onions, fields of berries, general farm crops, and some twelve to fifteen acres of peaches, showed the most thorough and clean cultivation of any large farm in the state. It is doubtful if a wheelbarrow load of weeds could have been gathered on the whole forty acres of cultivated crops.

August 17, at Southington, Messrs. E. Rogers, J. H. Merriman and E. D. Gridley united in inviting the Society to visit the great peach and apple orchards of the Shuttle meadow mountain district. Mr. Merriman, since elected President of our Society, has probably the largest and best cultivated bearing apple orchard in the state.

The last field meeting for 1899 was held on the grounds of the State Agricultural College, at Mansfield experimental orchards. A small nursery established by the students, a large swamp reclaimed for horticultural purposes, and the College and Experiment Station work in general, made up a most interesting exhibit, rounding out the year's work into fine shape.



The bush on the right shows the spring pruning of raspberry canes that were properly pinched back in summer.

A GENERAL SURVEY OF CONNECTICUT AND ITS HORTICULTURAL POSSIBILITIES

WHILE geographically one of the smallest states of the Union, and covering but one degree of latitude (41 to 42), owing to the great diversity of soil and varying elevations from the sea level, along the whole southern border, to 900 and 1,100 feet in sections of Tolland county, and 1,200 and 1,500 in portions of Litchfield, Connecticut is adapted to as wide a range of horticultural productions as any state outside of the semi-tropic fruit belt, the "season" of many of the quick-maturing species and varieties of fruits, flowers and vegetables often being entirely over on the light soil in the Connecticut valley and along the sound shore when like species and varieties are only just beginning to ripen on the cooler, moist soils of the hills of Tolland and Litchfield counties. Strawberries and green peas from East Hartford and Glastonbury supply the Hartford market, while on the Bolton hills, only 12 miles away, the blooming vines give promise of the crop that is to come after the valley season is entirely over; so that "home-grown" strawberries are usually to be had in the Hartford market for a period of six or seven weeks, the sound shore, Housatonic valley and Litchfield hills supplying New Haven, Bridgeport and other cities of the state through equally long seasons.

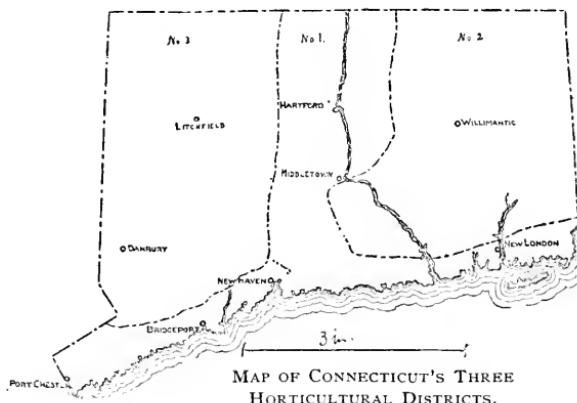
From the earliest settlement of the state, fruit growing for the family home supply has been a prominent feature of Connecticut agriculture, the apple being most in evidence, and the old seedling trees scattered over all our farms today are plain evidence that our ancestors took their apple juice through the spigot of the cider barrel rather than fresh from the pulp of the fresh fruit of some finer variety. A hundred years ago every farm-house cellar wintered from 30 to 50 barrels of cider, while today it is hardly respectable to

have any, and probably not one family in ten now has even one single barrel on tap as a beverage; yet in quantity and variety the family fruit supply has wonderfully increased and a daily supply of fresh home-grown fruit is the rule rather than the exception in most farm homes, small fruits in variety, apples, pears, peaches, plums (both European and Japan), cherries and quinces, in all the best standard varieties, coming to their highest perfection in every section of the state where rational methods of culture are followed. The topography of the state is such, and soils are so varied within short distances, that it is difficult to district the state, except in the most general way. Aside from the alluvial, most of the light, sandy and sandy loam lands are along the river valleys and the sound shore; while in "the hill towns" and along the ridges the soils are heavier, with more or less mixtures of clay, and many of the hilltops are moist and springy. Rocks are very abundant nearly all over the state except in the valleys, while the natural timber and semi-abandoned farm and pasture lands, growing up to brush and timber, cover fully one-half the acreage of the state. Acting at present as wind-breaks and climatic equalizers, they will in the future furnish the "new lands" for extensive horticultural enterprises. Lying midway between New York and Boston, the greatest horticultural markets of America, Connecticut is better situated than any other state in the Union to realize quick cash returns from her horticulture. Every farm is within driving distance of some one or more of her own busy manufacturing towns and villages, whose people are appreciative of choice fruits and are able to pay for them.

District No. 1.—This comprises the Connecticut river valley and adjacent hills, along the Northampton branch and the main line of railroad from Hartford to New Haven, and all of the shore towns. This district contains most of the sandy plain lands of the state, and the loams and clay most free from rocks and stones. On the hills back from the river, on the ridges either side of the railroads, and a few miles back from the sound shore, there are many places where soil and topographical conditions are much the same as in districts Nos. 2 and 3, but having much

larger tracts of easily cultivated lands and being better located as to market conditions, this district is more highly developed horticulturally than either of the others. Here are the great market gardens and small fruit farms, peach orchards, vineyards and melon fields.

District No. 2.—This district comprises Tolland and Windham counties and all of Middlesex and New London counties except Cromwell and the shore towns, and is particularly well suited to apple and peach culture, owing to



the rolling condition of the country and natural fertility of many of the hills. Every few miles are little valleys and pockets suited to the production of small fruits and vegetables in variety. A few townships in the northeast grow apples quite extensively, while in the west and southwest commercial peach orchards are found to considerable extent.

District No. 3.—This district comprises western Hartford, northwestern New Haven, northern Fairfield, and all of Litchfield counties, and is somewhat similar to district No. 2, except that the soil is generally heavier, with rather more mixture of clay and the hills are more abrupt and rocky. Some sections of Litchfield county are too cold and bleak for any but the most hardy fruits.

Apples grow freely everywhere, and, while always of good quality, the brightest colors, firmest texture and highest quality of fruit is produced on the rocky hills, at an elevation of from 400 to 1,000 feet. Baldwin, Rhode Island

Greening, Roxbury Russet and Spy are the leading varieties, although all the varieties that thrive well in the northeastern U. S. grow to perfection here when properly cared for. Old commercial orchards have always been profitable, and just at this time large plantings are being made, the largest orchard in the state containing about 4,000 trees.

Peach culture on an extended scale is a recent development. Eighteen years ago the only commercial orchard in the state contained about 2,000 trees, and probably 5,000 trees would be a liberal estimate for the state; now upwards of 2,000,000 peach trees are in the state—many orchards of 5,000 and 6,000 trees, quite a number with 10,000 to 15,000 trees, and one at least with nearly 50,000. While many varieties are grown to some extent, the main plantings are of Mountain Rose, Oldmixon, Crawford Early, Crawford Late and Stump. More recently, however, Waddell, Carman, Champion and Alberta have been heavily planted. High culture, close pruning and a thinning of the fruit are generally practiced, and fruit of brightest color, largest size and high quality is thus secured. In the markets of this and neighboring states, "Connecticut peaches" usually sell at a much higher price than those from any other section. The only serious drawback is the winter-killing of the fruit-buds in the valleys, this happening probably three years out of five, while on many hillsides and hilltops at least two crops out of three are assured; but there are many favorable localities where annual crops are almost a certainty.

Japanese plums were early planted in this state, and so quickly proved their adaptability to soil and climate that they are now planted in a small way in every section of the state, fruiting almost as freely as the apple for family supply, while in a commercial way they are being quite largely planted in district No. 1. Several orchards have from 2,000 to 4,000 trees each. Of varieties longest tested, Burbank, Abundance and Chabot are most satisfactory and profitable. Red June and Satsuma are rapidly growing in favor, the latter commanding extremely fancy prices for canning purposes.

Raspberries, blackberries, currants and gooseberries

grow and produce freely all over the state, and all local markets are abundantly supplied in season.

Grapes can be grown successfully all over the state, except on the highest and coldest hills; and on the sandy plains and warm, rocky hillsides all the best standard varieties can be produced in perfection. There are a number of small vineyards in district No. 1, and home-grown grapes sell for double the price of those coming from the outside; yet, on the whole, the grape industry is but lightly thought of.

Pears thrive and fruit well except on the lighter lands, and nearly every home garden has from one to half a dozen trees. There are a few small commercial orchards in district No. 1, Bartlett and Clapp being most largely grown at Hartford and the adjoining towns. On the west side of the river the Bosc is produced in its highest perfection.

Cherries have been steadily failing in the state for twenty-five years past; not enough for home supply are grown. Newly planted trees soon die out, and there is a general discouragement. They seem to do best in the vicinity of Middletown and Meriden, and the few commercial orchards there are quite profitable.

Quinces are grown all over the state for home supply, but thrive best along the sound shore, where there are a large number of small commercial orchards.

Strawberries are very largely grown, both for home and outside markets, mostly in medium matted rows, with an average yield of 80 to 90 bushels per acre. Some cultivators, who follow the hill system or grow in narrow, thinly matted rows, secure 150 or more bushels per acre. A number of the berry farmers have systems of irrigation which add greatly to the surety of the crop, besides increasing the size and appearance of the fruit. The rolling character of the country and vast number of small streams abundantly supplied with water make it possible, at moderate expense, to irrigate many thousands of acres in this state, and the time is not far distant when the streams of Connecticut will be more valuable to her horticulturists than they ever were to her manufacturers in the old days of abundant small factories and water-wheels.

Almost from the earliest settlement, small local nurseries have abounded in the state, and are here today to the number of 53. An extensive general nursery at New Canaan, in Fairfield county, is much the largest of any in New England, while the small fruit and specialty nursery at South Glastonbury, Hartford county, distributes plants by the million all over the world. At Cromwell, Middlesex county, is a floricultural establishment which, with one exception, has the largest area under glass of any such establishment in America, and surpasses all others in the annual production of superb roses.

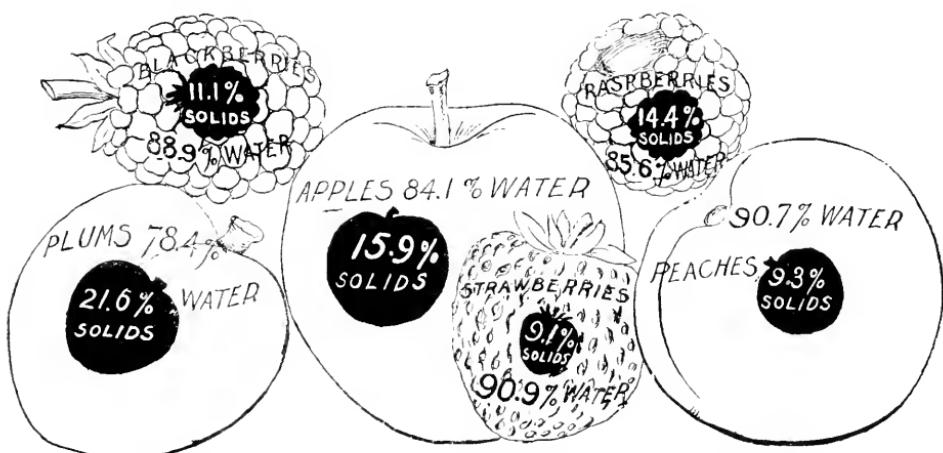
The late Judge A. J. Coe, of Meriden, was one of the first men in America to take up the new chestnut culture by the importation of the best foreign varieties and the selection of the best natives and their crosses. He commenced the grafting on native sprouts and seedlings, and stimulated quite a general chestnut grafting, so that a goodly number of chestnut orchards are being established on land too rough for cultivation, yet strong in its ability to grow the chestnut tree and nut to perfection.

At Wethersfield, in Hartford county, Orange and Milford, in New Haven county, and Southport, in Fairfield county, are many farms devoted to seed production. Onion seed and sweet corn are the great specialties, but a great variety of other seeds are also grown, especially at Wethersfield and Orange.

Market-gardening is carried on quite extensively by specialists near all large towns and cities, while, with so many good markets always close at hand, vegetables and fruits are sold in moderate quantities from nearly every farm. The largest general market-garden farm is at New Haven, where over 400 acres are under annual cultivation with vegetables and small fruits. At Southport, Fairfield and Westport there are many farms, both large and small, devoted entirely to the production of onions. "Southport onions" are famous for fine appearance and quality, and nowhere in America is the annual yield so great or price received so high as in this district. Marketing is done in sailing vessels direct from the farms to the dock markets in New York, where the onions are sold direct to retail dealers, boat captains acting as salesmen without commission for the sake of carrying the freight.

Trolley car lines, being quite widely extended through many farming sections of the state, and running express cars at certain hours of the day and freights at night, are proving quite a factor in the distribution of horticultural products. The Hale peach farms at South Glastonbury were the first in America to use the new electric power in the marketing of their products, fruit being loaded at the farm side-track as gathered during the day and transported to market at night, after passenger service has closed for the day, unloading in the city from the main line tracks, directly in front of the stores in the early morning hours before the tracks are again required for passenger service, and returning the empty cars to the farm side-track before a new day's work in the orchard has begun.

The Connecticut Pomological Society, organized some ten years ago, is a prominent feature in the lively fruit interests of the state. It has a large, active membership, and, aside from its annual winter meeting, it holds each summer three or more "field meetings," on fruit farms in different sections of the state, and there, around tree, plant and vine, the members meet and discuss the live topics of the hour, gathering inspiration which is marching Connecticut into the very front rank of horticultural states.—J. H. HALE, in *Cyclopedia of American Horticulture*.



THE WATER IN FRUITS.—The black spots show the solids; the balance is all water. The fellow who doesn't work water into his fruit usually has a crop of stuff not much larger than the solid spots!

THE VARIOUS CROPS OF AN APPLE ORCHARD

AN APPLE orchard is sure to bear you several crops beside the apple. There is the crop of sweet and tender reminiscences, dating from childhood and spanning the seasons from May to October, and making the orchard a sort of outlying part of the household. You have played there as a child, mused there as a youth or lover, strolled there as a thoughtful, sad-eyed man. Your father, perhaps, planted the trees or reared them from the seed, and you yourself have pruned and grafted them, and worked among them, till every separate tree has a peculiar history and meaning in your mind.

Then there is the never-failing crop of birds—robins, goldfinches, king-birds, cedar-birds, hair-birds, orioles, starlings—all nesting and breeding in tree-branches and fitly described by Wilson Flagg as “Birds of the Garden and Orchard.” Whether the Pippin and Sweet Bough bear or not, the “punctual birds” can always be depended upon. Indeed, there are few better places to study ornithology than in the orchard. Besides its regular occupants, many of the birds of the deeper forest find occasion to visit it during the season. The cuckoo comes for the tent-caterpillar, the jay for frozen apples, the ruffed grouse for buds, the crow foraging for birds’ eggs, the woodpecker and chickadees for their food, and the highhole for ants. The redbird comes, too, if only to see what a friendly covert its branches form, and the wood-thrush now and then comes out of the grove near by, and nests alongside of its cousin, the robin. The smaller hawks know that this is a most likely spot for their prey, and in the spring the shy northern warblers may be studied as they pause to feed on the fine insects amid its branches.

The mice love to dwell here also, and hither come, from the near woods, the squirrel and the rabbit. The latter will put his head through the boy’s slipper-noose any time for a taste of the sweet apple, and the red squirrel and chipmunk esteem its seeds a great rarity.—JOHN BURROUGHS.



CULTIVATING THE YOUNG TREES IN THE NURSERY.



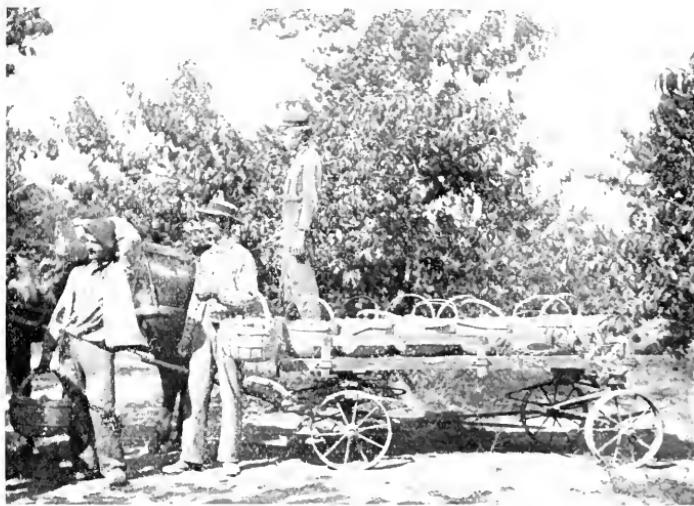
VIEW FROM THE HALE PEACH ORCHARDS.

This view shows five-year-old Elberta and Crosby peach trees in an orchard of 7,000 trees planted on upland hill-pasture of little value. It is from this height, when looking down upon the fruit farm at its foot, and beyond up and down the beautiful valley of the Connecticut, that we thank God we live in the country, and work with Nature.



A CORNER IN THE HALE CENTRAL FRUIT-HOUSE DURING PEACH AND JAPAN PLUM SEASON.

All fruit, as fast as gathered, is here carefully assorted, graded and packed honestly from top to bottom, in clean white packages, by intelligent women and girls, then loaded into trolley cars, and in the cool night hours transported to the city markets.



LOW CROSSED-REACH FRUIT WAGON IN ORCHARD.

This wagon is so constructed that the hind wheels always follow in the track of the front ones. No matter how short a turn is made, if the front wheels clear a tree the hind ones must and will.

A BRIEF HISTORY OF PEACH CULTURE IN CONNECTICUT

FROM its earliest history Connecticut has always reckoned the peach as one of her standard fruits.

During the latter part of the eighteenth and the early part of the nineteenth century peaches were over-abundant about every farm home, and having little or no commercial value, were freely used as food for swine, along with the other waste products of the farm.

The spread of that dread disease, the yellows, from 1840 to 1850, killed a vast majority of the peach trees in the state, and, while they continued to be planted for home supply, home-grown seedlings tainted with the disease and budding from diseased trees spread it so thoroughly that ten years later the peach had been almost exterminated in the state.

The growth of manufacturing cities and towns and the greater commercial handling of fruits were soon taken advantage of by New Jersey and Delaware, and in the twenty years preceding 1885, those states supplied Connecticut with most of her peaches.

About 1878, the late P. M. Augur, of Middlefield, set out to establish a commercial orchard of nearly 1,500 trees. Scattered over the state were a few other smaller attempts at commercial peach growing, but the yellows very soon ruined most of these orchards.

In the spring of 1880, J. H. Hale, of South Glastonbury, after a number of years' study of the peach and its requirements, planted an orchard of 3,000 trees, following it up with 3,000 the next year and 6,000 more two years later. Thorough culture, close annual pruning, liberal feeding with potash manures and pulling out and burning diseased trees as soon as discovered, were the principles back of this enterprise.

A moderate fruiting of these trees in 1884 stimulated a few others to plant, notably J. B. Smith, who planted at

Berlin and Deep River upwards of 25,000 trees, and Messrs. Platt and Barnes, in Cheshire, about 6,000.

Extreme frost in winter killed all fruit buds in 1885 and 1886, and it was not until 1887 that the Glastonbury orchards gave their first considerable crop. This attracted so much attention as to encourage large plantings of the peach, especially in Hartford, New Haven and Middlesex counties, so that in 1890 there were about 200,000 peach trees in commercial orchards of the state. The new enterprise was greatly stimulated by a large crop of superb peaches in 1889, that netted the growers from \$3.50 to \$5 per bushel. So great had the interest now become in this practically new industry that, for the purpose of information and protection, the first meeting of Connecticut peach growers was held at State Capitol, Hartford, February 11, 1891. As an outgrowth of this meeting, the Connecticut Pomological Society was organized.

Besides the increased planting in commercial orchards, there was also considerable peach planting in private gardens. Under more or less unfavorable conditions, and with indifferent culture, yellows quickly began to show itself, so, for the protection of this new industry in the state and their own financial investments, the Pomological Society authorized a committee to draft a law, and, if possible, secure its passage by the General Assembly. By means of this law it hoped to hold the yellows in check and, possibly, to wipe it out, through the destruction of diseased trees and the education and co-operation of tree owners. Michigan had quite successfully fought the disease for twelve years, and, to some extent, served as a model.

The Legislature of 1893 passed the following :

AN ACT

PROVIDING FOR A COMMISSION ON PEACH YELLOWS

GENERAL ASSEMBLY, JANUARY SESSION, A. D. 1893.

Be it enacted by the Senate and House of Representatives in General Assembly convened :

SECTION 1. The State Board of Agriculture shall, within thirty days from the passage of this act, appoint a Commissioner on Peach Yellows, to hold office during the pleasure of said Board. Said Commissioner may, with the approval of said Board and under the provisions of this act, adopt and carry out such plans as may be deemed necessary for the eradication of the disease common to peach trees, known as peach yellows.

SEC. 2. At all joint meetings of said Board and said Commissioner, for the purpose of conference, the Commissioner shall receive pay from the Board for his expenses only. Said Commissioner may, with the approval of said Board, appoint one or more Deputies in each county; and, when employed in the performance of duties imposed by this act, said Commissioner and his Deputies shall receive from the State, upon presentation to the Comptroller of bills duly sworn to, audited by the auditing committee of the Board of Agriculture, and approved by the Governor, five dollars per day and their expenses.

SEC. 3. Any peach, almond, apricot, or nectarine tree diseased by the yellows, and all fruit from any such diseased tree, is hereby declared a public nuisance, and it shall be the duty of said Commissioner or any Deputy, under such regulations as the State Board of Agriculture may adopt or approve of, to order such trees or such fruit destroyed, and, upon the failure of the owner to obey such order, to destroy such trees or fruit, and no damage shall be paid to such owner on account of such destruction.

SEC. 4. Any person may, when ordered to destroy any tree or fruit condemned by the said Commissioner or a Deputy, appeal to the State Board of Agriculture, and said Board shall appoint a committee of three experts, which committee shall not include the person who, acting as Commissioner or Deputy, ordered such tree or fruit destroyed, and the decision of such committee shall be final.

SEC. 5. Any person who shall, while such an appeal is pending, sell any tree from a nursery where there are found to be diseased trees, or any fruit from such tree; or who shall, without such appeal, or after such final decision, refuse to destroy such tree or fruit, shall be fined not less than one hundred nor more than five hundred dollars.

SEC. 6. Any person that shall knowingly buy, for the purpose of selling, or shall sell or offer for sale any fruit from such diseased trees, shall be fined not less than ten nor more than one hundred dollars.

SEC. 7. For the purpose of investigation or for the purpose of destroying trees or fruit known to be diseased, the said Commissioner and his Deputies may enter any premises; and any person who shall prevent or attempt to prevent such entry shall be punished by a fine of not less than ten nor more than one hundred dollars, or imprisoned in a common jail not less than ten nor more than sixty days, or both.

SEC. 8. Prosecutions for violations of this act may be brought, before justices of the peace, or any city, borough, town, police, or common pleas court having criminal jurisdiction, by any prosecuting officer, or by the Commissioner on Peach Yellows, or any of his Deputies, and for such purpose said Commissioner and his Deputies shall have all the powers of grand jurors.

SEC. 9. This act shall take effect upon its passage.

Approved June 14.*

* For further information as to the peach yellows law and its enforcement, see reports of Connecticut State Board of Agriculture for 1893, 1894, 1895 and 1896.

Under the foregoing law the following appointments were made:

By the State Board of Agriculture—

Commissioner on Peach yellows: Josiah M. Hubbard, of Middletown.

By the Commissioner, with the approval of the Board of Agriculture—

Deputies for Hartford County: A. C. Sternberg, of West Hartford, and Roswell A. Moore, of Berlin.

For New Haven County: Dennis Fenn, of Milford; E. C. Warner, of North Haven, and J. Norris Barnes, of Wallingford.

For Fairfield County: George C. Comstock, of Norwalk, and W. J. Jennings, of Greens Farms.

For Litchfield County: Ard. Welton, of Plymouth.

For Tolland County: Gideon Tillinghast, of Vernon.

For Windham County: Ezra C. May, of Woodstock.

For New London County: E. J. Hempstead, of New London.

For Middlesex County: George S. Butler, of Cromwell.

Working under special rules of the Commission, these deputies prior to October 1, 1893, had inspected all the commercial orchards of the state and quite a considerable number of trees in private gardens. They found practically 10 per cent of the 300,000 trees inspected to be affected with yellows, the percentage of disease varying from less than 1 per cent, in the best cared for orchards, up to more than 40 per cent in those where ignorance of the disease and neglect of culture were most prevalent.

The passage and intelligent enforcement of this law gave encouragement to many would-be planters, so that more than 100,000 trees were put out in new orchards in the spring of 1894. About an equal number were planted in the spring of 1895; while in 1896, more than 200,000 new trees were added to the orchards of the state.

As the quite thorough enforcement of the law showed a less and less percentage of diseased trees each year, Connecticut peach planters, all over the state thoroughly in sympathy with the law, very materially aided the Commission and deputies in its enforcement.

The only objectors to the law and its enforcement were the owners of diseased trees in private grounds. The owners of these few sickly and oftentimes dying trees cared little or nothing about the spread of disease, and preferred taking one more chance of a little inferior fruit from these worthless trees to aiding the state and their neighbors in building up a strong new industry—worth more than a million dollars annually. There were a few appeals under the law, but, in nearly every instance, the deputies were sustained and the condemned trees finally destroyed. In the case of one Amasa M. Main, of North Stonington, who refused to obey the Commission and destroy some 25 affected trees, the superior court of New London county imposed a fine of \$100, and on an appeal to the supreme court of the state, the law was fully sustained. Main then secured his election to the General Assembly of 1897, and worked for the repeal of the law under which he had been convicted in the highest courts of the state.

At a hearing before the Agricultural Committee, the owners of less than 200 trees asked for the repeal, while the owners of more than 450,000 trees asked for its retention and continued enforcement. Horticultural intelligence and business enterprise were all on the side of the law, while ignorance of the disease and jealousy of a new industry they could not fully grasp caused many country representatives to ask for the repeal of the law, and finally to vote for it. A majority of the city representatives and the most progressive of the farmer element voted to sustain the law, yet it was repealed, and discouragement fell upon the peach industry.

Since then the more extensive planters have continued to pull out and burn their diseased trees, while those with less at stake have been less prompt, and the disease is increasing in its destructive work. The wholesome, educational effect of the four years' enforcement of the law is counterbalanced by the unfounded belief that its repeal was evidence that there was little or no danger in the disease. The continued enforcement of the law would have cost the state about \$8,000 per year; its repeal is costing the small farmers of the state from \$200,000 to \$300,000 per annum, and a genuine loss to the state as a whole.

However, orchard planting still goes on, until now there are about 1,500,000 trees in the state. It is estimated by careful observers that about one-half of them are being kept almost free from yellows and are likely to be profitable. The other half are either so infested with the disease or so neglected that the trees are not likely ever to be very profitable to their owners, while they are a standing menace to near-by land owners, who might be able to grow healthy and profitable orchards if these disease-spreading trees were out of the way.

Were it not for the yellows, Connecticut would be as reliable a peach state as any in the Union. In the last twenty years it has had ten full crops of fruit, three fairly good ones, three partial ones, and four almost total failures. One of the failures was caused by a frost in May, when the trees were in bloom; one by two weeks of warm rainy weather at blooming time, and all others by extremes of frost, from 12 to 22 degrees below zero, that killed the dormant buds in winter. Six years out of the eight the freezing was done between December 22 and January 2; once it was done late in January, and once again late in February. The older so-called peach-growing states cannot show as good a record as this.

Commercial peach planting in Connecticut, at the opening of 1900, is mostly in orchards of from five to ten acres in extent. Quite a large number of orchards cover from 20 to 30 acres; three or four of them cover 50 acres or so. The Hale & Coleman orchard, in Oxford, near Seymour; that of J. Norris Barnes, at Yalesville, and those of J. H. Hale, at South Glastonbury, are each over 100 acres in extent.

THE OLD-FASHIONED APPLE ORCHARD

By W. J. GREEN, Horticulturist Ohio Experiment Station

IN TRYING to forecast the future of the apple orchard, my mind reverts irresistibly to the past. One orchard, in particular, crowds itself on my memory, and this is the type of many others well known in the past, nor is the class yet extinct.

It is the old orchard back of the barn where the lambs frisked in the early spring, in the season between "hay and grass," where we children chased the calves and little pigs, and where the horned patriarch of the flock sometimes chased us. This old orchard was primarily a calf pasture; cattle and horses had no place in it; sheep and hogs were allowed on special occasions, but the hogs were civilized hogs, not by nature, but because they had rings in their noses. The grassy turf was almost like a lawn. The trees were full of vigor, some reaching skyward beyond the length of any ladder, but the fruit they bore did not need careful handling to get it to the cider mill. A few had been despoiled and subdued by the artful grafted.

There were Greenings and Gates, Rambos, Golden Sweets and Harvest apples enough for the family, and sometimes a surplus for market, while cider apples were never lacking.

The trees gave shade to the calves and did not destroy the pasture. The calves grew into fat steers and sleek cows. These brought cash, and the pigs and lambs added their quota also. Very naturally, there was an abundance of good feeling toward the old orchard.

The children loved it, for there was always life, animation and companionship there. The elders prized it because of the steady income which it yielded, both directly and indirectly; nor did they begrudge it a year's

rest after it had yielded a bountiful harvest, for it never lost its usefulness even in the off years. If its only mission had been to bear apples for market there might have been reason to complain both as to the quantity and quality of the fruit.

It was like a general-purpose animal. If it could not do one thing well, it could do several things indifferently, and because it had so many uses it was indispensable. In former days the general-purpose cow, or horse, or machine, was looked upon with more favor than now. The cow that could make a moderate amount of butter and had a good carcass for beef was considered to be more valuable than one good for butter alone, even though she was far above the average in this respect. There are still some who, as John Gould pithily puts it, "would keep an indifferent butter cow, simply because she would sell for beef at the administrator's sale."

One can imagine why a Frenchman would choose a general-purpose horse for a family beast; he could drive it to the carriage for a score of years and then make French beef of it.

Even the general-purpose man is not wanted so much as he used to be. We may admire versatility, but the market for skilled labor quotes versatility at a low rate. The man, the animal, the machine which can do one thing, and do it well, is wanted nowadays. So far as the man is concerned, this tendency seems almost deplorable, but the tiller of the soil is not becoming specialized to a dangerous degree. There is still opportunity for him to exercise all of his endowments, and yet he, too, is becoming a specialist on a broad basis.

But the orchard, the general-purpose orchard,—are its days numbered? I think not, unless tuberculosis removes the necessity of a calf pasture.

As long as the orchard back of the barn is so very convenient it will remain. There is no reason why it should not. It still has a mission, but if anyone supposes that it can fulfil all of the requirements of a modern orchard then he must be one of those who believe that a horse can pull a plow one day and take first money at the race-

course the next; or that a cow can give 8,000 pounds of milk in a year and then successfully compete in the fat-stock show.

The commercial apple orchard of the future is to be like the specialized animal; it must be for one purpose mainly and brought up to the highest point of excellence in that particular. The general-purpose orchard may remain on most farms, but it will not supply the market with any considerable quantity of fruit. The commercial orchard alone can meet the exacting demands of the city market.

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